REPORT
ON
SIXTH INTERNATIONAL CONGRESS
OF MILITARY MEDICINE AND PHARMACY
THE HAGUE, NETHERLANDS, JUNE 1931

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HIS ROYAL HIGHNESS HENDRIK, PRINCE CONSORT OF THE NETHERLANDS, WHO OPENED THE INAUGURAL SESSION OF THE CONGRESS AND WHO GRACIOUSLY FURNISHED THIS AUTOGRAPHED PHOTOGRAPH FOR THE REPORT OF THE UNITED STATES OF AMERICA

THE DEPARTMENT OF STATE
CONFERENCE SERIES No. 12

Sixth International Congress of Military Medicine and Pharmacy
and
Meetings of the Permanent Committee
The Hague, Netherlands, June 1931

REPORT OF

COMMANDER WILLIAM SEAMAN BAINBRIDGE
M. C.-F., U. S. N. R.

FOR

THE DELEGATION FROM THE UNITED STATES OF AMERICA

CAPT. J. C. PRYOR, M. C., U. S. Navy, *Chief of Delegation*
COL. C. R. REYNOLDS, M. C., U. S. Army
ASST. SURG. GEN. R. C. WILLIAMS, U. S. P. H. S.
COL. R. A. FENTON, Med. Res., U. S. Army
COL. F. H. VINUP, M. C., Md. N. G.
MAJ. EDGAR ERSKINE HUME, M. C., U. S. Army, *Secretary*
COL. J. H. MCCULLOUGH, M. C., N. J. N. G.
LIEUT. COL. FRANCIS FRONCZAK, Med. Res., U. S. Army
COMDR. WM. SEAMAN BAINBRIDGE, M. C.-F., U. S. N. R.
Member of the Permanent Committee

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FOREWORD

Science does not recognize national boundaries or limitations of race or language and no man can claim to be master of any branch of science who is ignorant of what contributions are being made to it by other nations than his own. This is particularly true of American medical men with regard to the specialty of military medicine because we are not a military people and are not inclined to busy ourselves with any branch of the art of war until the storm is upon us. Therefore, it is peculiarly important that those of our medical profession who propose to acquire a broad knowledge of military medicine in either its professional or its administrative aspects should be able to share the knowledge and the experience of other nations from whose political horizons war clouds are rarely entirely absent. This the biennial International Congresses of Military Medicine and Pharmacy enable us to do, and by the wise liberality of the Congress of the United States we were able to send an unusually strong and representative delegation to the meeting at The Hague last year, the proceedings of which are made available to us in this volume by the industry and patriotic zeal of Commander Bainbridge to whom we are also indebted for the published proceedings of the antecedent congresses.

ROBERT U. PATTERSON
Major General, The Surgeon General, U. S. Army

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REPORT ON

SIXTH INTERNATIONAL CONGRESS OF MILITARY MEDICINE AND PHARMACY

INTRODUCTION

The Sixth International Congress of Military Medicine and Pharmacy, which met at The Hague in June 1931, marked an auspicious epoch in its history, for this was the tenth anniversary of the inception of these gatherings. As one who was a delegate to the conferences from beginning, and is the United States member of the Permanent Committee, it is gratifying to view, in retrospect, the birth, the development, and the coming to maturity of this practical vision of a doorway, opening on a road upon which much help to the human family may travel swiftly and surely.

In the past, some experiences of war, from their medical, surgical, and sanitary aspects, have been summarized by one side or another. The result of a battle on the life or limb of a combatant, the immediate treatment given, special operations performed soon after the infliction of an injury, have become part of medico-military literature, and have often been a guide to the military surgeon during a subsequent war.

But a new understanding of medico-military history has been conceived by the International Congress of Military Medicine and Pharmacy.

In 1921, about three years after the maelstrom that engulfed the world, when the nations were endeavoring to weave together once again the torn shreds of their existence, which had been ruthlessly frayed and broken during the conflict of 1914 to 1918, Belgium sowed the seed of the International Congress of Military Medicine and Pharmacy. She invited the Governments of the Allied, Associated, and Neutral Powers, and the new nations, to send representatives of the medical services of their armies, navies, and air forces to Brussels, to discuss all branches of the medical lessons of the World War. Later, those countries which had signed the Locarno Treaty, and those that had joined the League of Nations, were

included. Following upon the Brussels Conference, meetings have been held in Rome (1923), Paris (1925), Warsaw (1927), London (1929), and at The Hague (1931). It was Belgium's hope, based on far-sighted vision, to collect all the lessons of the war in medicine, surgery, sanitation, pharmacy, and dentistry, gained on both sides of the firing-line, in every sector, including the unusual as well as the common conditions that were dealt with, from the front lines back to the convalescent camps, and further, to study the remote results, years later, of war diseases, injuries, and therapeutic measures. Thus, all who had been in direct contact with the soldier wounded in body or with mind affected, and who also had opportunity to note the effects of war upon the civilian population, could summarize their experience for the benefit of all, and the medico-military history of the World War would be a comprehensive one.

In order to make exhaustive studies of every subject, a Congress is held every two years, with meetings of the Permanent Committee in the intervening year, whenever necessary. At each Congress, five main topics are considered, with official reports from two countries—one from the nation in which the Congress is held, and one from another, selected because of particular experience in the subject under discussion—and short communications relevant to the matters under consideration, from any that desire to make such a contribution. Certain subjects have only now been reached, as it was necessary to wait for the lapse of years before definite conclusions could be arrived at; and there are many others still to be dealt with. Final conclusions are not accepted except by the unanimous vote of the entire Congress.

Day by day, in all countries, peace-time warfare is being waged at sea, on land, in the air, in mines and factories, with man-made machinery, explosives, and the elements. The resulting casualties require treatment such as that given to the war wounded. Therefore, the experiences gained in medicine, surgery, and sanitation in war are of vital assistance in caring for the man-power of the nation during peace. The World War furnished the greatest of world clinics, and from many of the tragedies that arose out of that cataclysm countless lessons were taught us. The knowledge thus gained, when rendered available in permanent form, will be utilized for the help of all, in peace as well as in war.

Plans had been made at the London Congress, 1929, to hold the sixth meeting in Budapest, but later, internal conditions in Hungary made this impossible. The Netherlands cordially expressed a desire for the reunion to take place on her soil. Accordingly, and

most appropriately, the tenth anniversary of the Congress was celebrated at The Hague, the City of Peace.

The International Congress of Military Medicine and Pharmacy was formed primarily for the correlation, standardization, and codification of all the medical lessons of the World War, and the internationalization of the work of the sanitary services of the world. In addition, the meetings of leaders in their field, having a deep humanitarian mission, the exchange of opinions, the appreciation of ideals, the gradual understanding of differences among peoples, and the common ground upon which individuals of culture may meet, all tend toward that great goal for which mankind is striving—peace.

LOCAL OFFICERS OF THE CONGRESS

President

Major General Johan Carol Diehl, Director of the Service de Santé of the Netherland Army.

Honorary Presidents

Dr. Th. Tuffier,[1] Member of the Academy of Medicine, Paris; President of the Interallied Surgical Conferences.

Inspector General Wibin,[2] Inspector General of the Belgian Army Medical Services; President of the First International Congress of Military Medicine and Pharmacy, Brussels.

Major General Francesco Della Valle, Former Director General of Medical Services of the Italian Army; President of the Second International Congress of Military Medicine and Pharmacy, Rome.

Medical Inspector General Vincent, Former Inspector General, French Army Medical Services; President of the Third International Congress of Military Medicine and Pharmacy, Paris.

General Stanislaw Rouppert, Director of Medical Services, Polish Army; President of the Fourth International Congress of Military Medicine and Pharmacy, Warsaw.

Lieutenant General Sir Matthew H. G. Fell, K.C.B., C.M.G., K.H.P., F.R.C.S., Former Director General, Royal Army Medical Services; President of the Fifth International Congress of Military Medicine and Pharmacy, London.

Vice President

Médecin-Major de la Réserve Dr. M. Barkey Wolf van Geersdijk.

Secretary

Jonkheer R. Sandberg van Boelens.

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[1] Deceased.

[2] Deceased August 1931.

Assistant Secretary

Lieutenant de Cavalerie P. Forbes Wels.

Treasurer

Lieutenant-Colonel en retraite de l'Administration Militaire G. F. Sloot.

Exposition Committee

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Docteur Hs. A. Molema de la Croix-Rouge Néerlandaise.
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Lieutenant-Général en retraite J. F. B. Kalff (Chairman).
Capitaine d'Artillerie Jonkheer H. Laman Trip.
Lieutenant des Grenadiers I. H. Bolman.

LIST OF OFFICIAL DELEGATES

[NOTE.—No attempt is made to give English equivalents of military titles, but the list as given by the Committee at The Hague is adhered to.]

ARGENTINA

C. L. ROASENDA, 1r Lieutenant du Service de Santé de l'Armée Argentine.
A. SCHNAIBEL, Lieutenant-Colonel du Service de Santé de l'Armée Argentine.

AUSTRALIA

R. HYLTON, Major, Australian Army Medical Corps.

BELGIUM

F. C. DE BLOCK, Major-Médecin, Professeur à l'École Militaire de l'Armée Belge.
G. C. M. T. CAMBRESIER, Capitaine-Médecin.
S. Exc. P. DEMOLDER, Lieutenant-Général-Médecin, Inspecteur-Général du Service de Santé de l'Armée Belge.
L. COUZIJN.
I. ETIENNE, Capitaine en 1r Pharmacien de Réserve.
I. J. VAN DER GHINST, Major Médecin der Reserve, Chargé de Cours, Université Bruxelles.
W. PROOT, Major-Pharmacien, Chef de la Pharmacie Militaire, Malines.
J. VONCKEN, Lieutenant-Colonel-Médecin.

CHILE

B. MUNOZ PAL, Cirujia Jeneral.

CHINA

CHEN TSUNG JUNG, Chirurgien-Colonel de l'Armée Chinoise.

CZECHOSLOVAKIA

L. Fisher, Général-Chef et Directeur du Service de Santé de l'Armée Tchécoslovaque.
H. Pokorny, Lieutenant-Colonel-Médecin.

DENMARK

H. Scheuermann, Capitaine, Médecin-en-Chef de 1ère Classe.

DUTCH INDIES

A. L. Schenk, Gep. Dir. Off. v. Gez. le kl. N.I.L., Vertegenwoordiger van het Departement van Koloniën en van den Geneeskundigen Dienst van het N.I.L.
G. A. Sedée, Off. v. Gez. le kl. N.I.L., Chef van den Geneeskundigen Dienst van de Koloniale Reserve.

ESTONIA

L. Puusepp, Général-Major-Médecin, Consultant de l'Armée Estonnienne, Professeur de l'Université.

FINLAND

M. Savolin, Sanitätsmajor.

FRANCE

G. H. Barthet, Pharmacien-Commandant de Réserve de la Région de Paris.
J. H. Bercher, Médecin-Lieutenant-Colonel, Chirurgien et Spécialiste des Hôpitaux Militaires, de l'Hôpital Militaire de Val-de-Grâce.
P. Botreau-Roussel, Médecin-Colonel, Professeur à l'École d'Application du Service de Santé des Troupes Coloniales.
F. Chaput, Pharmacien-Colonel, Gestionnaire de la Pharmacie Centrale du Service de Santé.
A. J. Fribourg-Blanc, Médecin-Commandant, Professeur Agrégé au Val-de-Grâce, Professeur à l'École d'Application du Service de Santé.

E. Lanne, Médecin-Général-Inspecteur, Président du Comité Consultatif de Santé, Chef de la Délégation Française.
Malaspina, Médecin-Colonel, Adjoint au Directeur du Service de Santé au Ministère de la Guerre.
C. J. B. Mathis, Médecin-Général du Corps de Santé des Troupes Coloniales.
M. Nicloux, Médecin-Commandant de Réserve de la 20e Région.
R. F. Pâitre, Médecin-Lieutenant-Colonel, Professeur Agrégé au Val-de-Grâce, Professeur à l'École d'Application du Service de Santé.
A. Schickelé, Médecin-Colonel, Chef de la Section Technique du Service de Santé.
Ch. M. L. Spire, Médecin-Général, Adjoint au Médecin-Général-Inspecteur, Inspecteur Permanent des Écoles du Service de Santé Militaire.
V. G. J. Vansteenberghe, Capitaine d'Administration de Réserve, du Service de Santé de la 1re Région.
A. Vivie, Médecin-Colonel des Troupes Coloniales.
C. F. Wintergerst, Dentiste-Militaire de 1ère Classe de Réserve de la Région de Paris.
E. J. E. M. Bellet, Médecin-en-Chef de 1re Classe de la Marine (Colonel).
J. Liffran, Médecin-Général de la Marine.
A. Saint-Sernin, Pharmacien-Chimiste-en-Chef de 1ère Classe (Colonel).

GREAT BRITAIN

Alden Turner, M.D., F.R.C.P.
W. Benson, Colonel, D.S.O., R.A.M.C., Officer Commander, Queen Alexandra Military Hospital, London.
G. de la Cour, Colonel, O.B.E., M.B., Consulting Surgeon.
Sir H. B. Fawcus, Lieutenant General, K.C.B., C.M.G., D.S.O., D.C.L., M.B., Director General Army Medical Services.
Sir A. J. Gaskell, K.C.B., O.B.E., K.H.S., F.R.C.S., D.P.H., L.R.C.P., Surgeon Vice Admiral, Medical Director General of the Royal Navy.
J. P. Helliwell, C.B.E., Assistant Director General, Army Medical Services (Dental).
J. Kyle, Squadron Leader, Royal Air Force, Medical Services.
W. P. MacArthur, Colonel, R.A.M.C., D.S.O., O.B.E., M.D., F.R., C.P.I., Consulting Physician.

J. MacIntyre, Air Commodore, Director of Medical Services, Royal Air Force.
E. Saville Peck, Major.
F. L. Smith, Surgeon Commander, Assistant to the Medical Director of the Royal Navy.
A. D. Stirling, Major, D.S.O., M.B., Deputy Assistant Director General, Army Medical Services.

INDIA

F. F. Strother Smith, Lieutenant Colonel, I.M.S.

IRISH FREE STATE

T. MacKinney, Major Director, Medical Services, Department of Defense.

ITALY

F. Caccia, Colonnello Medico, Direttore Sanita, Direzione di Sanita, Corpo d'Armato.
A. Casarini, Lieutenant-Colonel-Médecin, Directeur du Journal de Médecine-Militaire.
D. Casella, Tenente Colonnello Medico, Capo Reparto Chirurgia.
Prof. Dr. G. Galata, Tenente Colonnello Medico, R.M.
Dr. C. Gorreta, Maggiore Chimico Farmacista.
E. Micheletti, Tenente Colonnello Medico Regia Marina, Ministerio della Marina.

JAPAN

K. Hosoya, Ober Stabsarzt der Japanischen Armee.
T. Koidzumi, Stabsarzt der Japanischen Armee.
T. Osuka, General Oberarzt der Japanischen Marine.

LATVIA

A. Brambats, Médecin-Colonel, Sous-Chef du Directeur du Service de Santé Militaire.

MEXICO

S. Exc. Sr. F. Castillo Najera, Général-Médecin, Envoyé Extraordinaire et Ministre Plenipotentiaire du Mexique au Pays-Bas.

NETHERLANDS

J. F. Hulk, Hoofdoff. v. Gez. 1e kl., Chef van den Geneeskundigen dienst der Zeemacht.
S. W. Praag, Dir. Off. v. Gez. 2e kl., Chef van het Militair Hospitaal, Utrecht.

PARAGUAY

B. Calcena Acevalo.

PERU

C. A. Bambaren, Major, Jefe del Departamento de Higiene Mental y Neuropsiquiatria del Ejercito.

POLAND

W. J. Babecki, Lieutenant-Colonel-Médecin, Directeur du Laboratoire d'Hygiène au Centre d'Instruction Médicale de l'Armee.
A. Huszcza, Colonel-Médecin, Directeur du Centre d'Études Médicales en Aviation.
J. Kollataj-Srzednicki, Général de Brigade, Commandant du Centre Médical Militaire.
S. Krupinski, Colonel-Pharmacien, Chef du Service d'Approvisionnement Sanitaire.
S. Mieszkis, Lieutenant-Colonel-Dentiste, Directeur du Dispensaire Militaire Central Stomatologique.
S. Rouppert, Général de Brigade, Chef du Service de Santé, Chef de la Délégation Officielle Polonaise.

RUMANIA

M. Butoïanu, Médecin-Général, Inspecteur Technique du Service de Santé de l'Armée Roumaine.
D. Theodorescu, Capitaine-Médecin, Adjoint à l'Hôpital Central.

SPAIN

A. van Baumberghen, Lieutenant-Colonel-Médecin, Membre du Comité Permanent et Président de la Commission Internationale pour la Standardisation du Matériel Sanitaire.
E. Blasco Salas, Capitán Médico, Regimento de Cabelleria de Calatrava.
Guerrero Rafael Roldan, Pharmacien-Major de 1ère Classe.

J. Rueda Pena, Commandant-Médecin de la Marine de Guerre, Représentant du Ministère de la Marine.
J. Sanchez Gomez, Médecin-Major de la Marine de Guerre.
A. Vallejo Nagera, Comandante Médico, Director del Manicomio de Ciempozuelos.

SWEDEN

C. O. Barre, Médecin-en-Chef a Kungl. Södermanlands Regimente. Médecin-Major de 1 ère Classe.

SWITZERLAND

K. Hauser, Colonel-Médecin-en-Chef de l'Armée Suisse.
J. Thomann, Colonel, Pharmacien-en-Chef de l'Armée Suisse.
P. Vollenweider, Lieutenant-Colonel-Médecin de la 2ème Division.

TURKEY

I. Mazlum Bey, Inspecteur-Colonel-Médecin, Inspecteur-Général du Service de Santé du Grand État Major de la République Turque.
H. Kadri Bey, Médecin-Colonel, Sous-Directeur de l'Hôpital d'Application " Gülhané ".

UNITED STATES OF AMERICA

Wm. Seaman Bainbridge, Commander, Medical Corps Fleet, United States Naval Reserve.
R. A. Fenton, Colonel, Medical Reserve, United States Army.
F. E. Fronczak, Lieutenant Colonel, Medical Reserve, United States Army.
Edgar Erskine Hume, Major, Medical Corps, United States Army.
J. H. MacCullough, Colonel of the 119th Medical Regiment, National Guard.
Angus McLean,[1] Colonel, Auxiliary Reserve, United States Army.
James C. Pryor, Captain, Medical Corps, United States Navy, *Chairman.*
C. R. Reynolds, Colonel, Medical Corps, United States Army.
F. H. Vinup, Colonel, Maryland National Guard.
R. C. Williams, Assistant Surgeon General, United States Public Health Service.

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[1] Unable to attend.

URUGUAY

B. Vignale.

YUGOSLAVIA

A. Georgevitch, Major-Médecin.
Y. Staitch, Général-Médecin, Directeur du Service de Santé.
R. Yovanovitch, Lieutenant-Colonel-Médecin de Santé.

INTERNATIONAL COMMITTEE OF THE RED CROSS

G. Patry.

LEAGUE OF THE RED CROSS SOCIETIES

G. Patry.

Lack of space prevents the inclusion here of the names of the very large number of members from many countries who attended the Congress, many of whom took part in the various scientific discussions.

RULES OF THE SIXTH CONGRESS

REPORTS AND COMMUNICATIONS

1. The reading of each report during the meetings must not exceed twenty minutes.

2. Communications only on the questions under discussion are admitted; they must not exceed eight pages of text. Ten minutes will be allowed for each. In order that they may be included in the program of the meetings, titles and résumés of the communications must be sent to the Congress secretariat prior to May 15.

3. Requests for the projecting of films and all necessary details must be received before May 15.

4. When the discussion of a subject is finished those who presented official reports, those who read communications, and those who took part in the discussion will meet in one of the halls of the Congress to draw up the general conclusions. These will be submitted to the vote of the Congress at the last meeting.

PROGRAM

SIXTH INTERNATIONAL CONGRESS OF MILITARY MEDICINE AND PHARMACY

Sunday, June 14.—Meeting of Permanent Committee.

Monday, June 15.—Issue of badges, documents, etc. Subscriptions to excursions, banquet, etc. Meeting of the chiefs of delegations and national correspondents. Administrative session. Inaugural meeting. Opening of the Historic Exposition of the Services de Santé. Official photograph of Congress. Dinner to the official delegates, etc., by the Netherland Government.

Tuesday, June 16.—Meeting of the Congress. First Question.—Recruiting, Training, and Advanced Training of Military Medical Officers and Pharmacists. (Reporting countries: The Netherlands and Yugoslavia.) Soirée by the Lord Mayor and Corporation of the City of The Hague. Special program for the ladies.

Wednesday, June 17.—Second Question.—Psychoneuroses of War; the Immediate and Remote Effects of War on the Nervous System of Combatants and Noncombatants. (Reporting countries: France and the United States of America.) Fourth Question.—The Preparation and Storage of Medicinal Ampoules in use in the Medical Services. (Reporting countries: The Netherlands and Rumania.) Tea given by the Red Cross of the Netherlands. Special program for the ladies.

Thursday, June 18.—Third Question.—Methods of Hemostasis on the Battlefield; Standardization of First-aid Material and the Mode of Application. (Reporting countries: The Netherlands and Italy.) Fifth Question.—The Sequelae of War Wounds of the Teeth and Inferior Maxilla; Their Treatment. (Reporting countries: The Netherlands and Poland.) Soirée by the Netherland Government. Special program for the ladies.

Friday, June 19.—Excursion to Leyden, Rotterdam, and Amsterdam. Meeting of Permanent Committee. Approval of conclusions and preparation for final session. Subscription banquet. Final meeting. Historic Exposition of the Services de Santé.

INAUGURATION OF THE CONGRESS

INAUGURATION OF THE CONGRESS

The Congress Opened by His Royal Highness Hendrik, Prince Consort, Representing the Queen of the Netherlands

His Royal Highness Hendrik, Prince Consort, representing the Queen of the Netherlands, opened the inaugural session of the Congress at the Gebouw voor Kunsten en Wetenschappen. The meeting was presided over by the Minister of National Defense. The gathering was a brilliant one and consisted of the official delegates of the armies, navies, and air forces of thirty-two nations, in full uniform, members of the Permanent Committee, a large number of Congress members, the entire Diplomatic Corps at The Hague, high officials of the Ministry, and municipal officials. Addresses were delivered by His Excellency Mr. Deckers, Minister of National Defense of the Netherlands; General Diehl, President of the Sixth Congress; Colonel Voncken, Secretary of the Permanent Committee; Inspector General Lanne of the French Army; and Professor J. G. de Lint, President of the Committee of the International Historical Exhibition of the Medical Services.

The Congress Welcomed by the Netherland Minister of National Defense

In the name of Her Majesty the Queen of the Netherlands, His Excellency Mr. Deckers, the Minister of National Defense, extended to the delegates and members of the Sixth International Congress of Military Medicine and Pharmacy, a most cordial welcome to the Netherlands. He stated that thirty-two governments had accepted the invitation to participate in the Congress; that over one hundred official delegates and about five hundred members from all parts of the civilized world were present. Such a participation in a period of economic depression as we are now experiencing, is a proof of the general belief in the utility of these Congresses. A rapid survey of the programs of the preceding meetings shows that matters of the highest importance for the treatment of sick and wounded combatants have been dealt with; and these subjects are of equal importance to the civilian community. These Congresses are the expression of efforts towards progress, through addition to our knowledge and the further development of science. It is a gratification

to believe that the discussions of the Sixth International Congress of Military Medicine and Pharmacy will once again prove this beneficial tendency.

The Congress Addressed by Major General J. C. Diehl, President of the Congress

The President of the Congress pointed out that the Sixth Congress is of very especial importance in that it celebrates, at the same time, the tenth anniversary of these reunions, which have effectively proved the right to their existence. The duties of the medical officers, modest though their work may appear to those who do not understand the situation, are, in reality, very serious and onerous. The medical officer must be a clinician, therapeutist, hygienist, epidemiologist, forensic expert, psychologist, organizer, administrator, instructor. The interest of the state, as well as of the world, demands that all the means at the disposal of modern science be applied for the reduction to a minimum of all threatened dangers. The World War has provided an abundance of experience and a notable progress in technique. It has taught the lesson that a close connection between physician, surgeon, and dentist, with faithful cooperation in their work, is an essential requirement and condition for success. However, it would seem that the great importance of the International Congresses of Military Medicine and Pharmacy is not to be sought exclusively and not even principally, in their purely scientific value, but especially in the international agreement between officers of the medical services.

The Congress Addressed by Colonel Voncken, Secretary of the Permanent Committee

Speaking for the Permanent Committee, Colonel Voncken, its Secretary, stated that it is most joyful and fitting to have united at The Hague, which was the center of the first universal manifestation of peace, the International Congress of Military Medicine and Pharmacy on the occasion of its tenth anniversary. The Permanent Committee called six Congresses, the studies and results of which are known to this assembly. More than four years ago, it started to publish the *Bulletin International de Médecine et de Pharmacie Militaires*, which endeavors to reflect, in its monthly issues, the entire medico-military activity of the world. Up to date, it has the collaboration of thirty-six nations, and its correspondents sedulously compete with one another in investing it with the greatest practical interest. Finally, the Permanent Committee created in 1930, at the

International Assembly of the Medical Services at Liége, the Bureau of Medico-military Documentation. "This Assembly is indeed unforgetable, because, for the first time in the annals of the world, military chieftains met and were united in a lofty ideal of peace and humanity. May this Congress, which is now convening at The Hague—the city which was the first emblem of universal peace, symbolic of the rights of the people, the right to live, the duty of commiseration in suffering and of international justice—act as a stimulus to further growth and to the strength gained by maturity!"

The Congress Addressed by Inspector General Lanne, of the Medical Service of the French Army

In the name of the foreign delegations, reunited at the opening session of the Sixth Congress, Inspector General Lanne, of the Medical Service of the French Army, tendered his salutations to the President and requested him to extend the respectful homage of her guests in the delightful country of Holland, to Her Gracious Majesty, Queen Wilhelmina. He cordially thanked the Minister of National Defense for his amiable welcoming words, and stated that General Diehl, Chief of the Medical Service of the Dutch Army, may rest assured of the sentiments of gratitude and sympathy of all present, and so may all his collaborators in the organization of this Congress, which, on first contact of all its participants, promises to be highly successful. "Strong in the already accomplished results, having learned to know and to esteem each other as united workers in an excellent and generous cause, we again assert the heart-felt desire to pursue, in all confidence, the task of humanity and charity begun ten years ago. We can no better prove all our devotion and patriotism to our respective countries than by working together in the search for the best means of relief of the sufferings of their sons."

The Congress Addressed by Dr. J. G. de Lint, President of the Committee of the International Historical Exhibition of the Medical Services

In his remarks, Adjunct Professor Dr. J. G. de Lint, President of the Committee of the International Historical Exhibition of the Medical Services, stated as follows:

> It is a profound truth that a science can not be understood without a knowledge of its history. Military medicine has always been primarily concerned with the treatment of war wounds. It was not until after the introduction of standing-armies that it became necessary to establish a military medical service corps, charged with the care of soldiers in war and in peace. Among

the Egyptians, the Romans, and throughout the entire Middle Ages, surgeons were invited to follow the armies and, at the end of each war, were obliged to return to ordinary practice, except the most famous, who obtained the position of Surgeon to the King. Consequently, in days of old, there were no real medical officers, military medicine being identified with surgery, and a study of this subject requires a consultation of the writings of the old surgeons. On the occasion of the Sixth International Congress of Military Medicine and Pharmacy, an effort has been successfully carried out to compose a small exhibition to show the evolution and progress of military medicine; an exhibition in which surgery undoubtedly occupies the most prominent place. By virtue of the cooperation of various governments, several museums of institutes of medical history, and collectors of engravings, it has been possible to gather a rather complete collection of old surgical instruments, pictures, and engravings, showing the treatment of the wounded as well as the transportation of casualties; and a very remarkable collection of portraits and autographs of the most famous military surgeons. Several libraries courteously offered a selection of books dealing with military surgery, medicine, and pharmacy. Although some of these books are to be classified as rarities of the first rank, the majority are of value only for those who are personally interested in military medicine and pharmacy. A convenient place has been provided in the hall where these books can be consulted, and it is hoped that many members of the Congress will avail themselves of this opportunity, and that it will increase the interest of its visitors in the history of medicine.

MEETINGS OF THE CONGRESS

The meetings of the Congress were held in the Hall of the Knights, the ancient palace at which the Second Peace Conference met, reserved for public ceremonies. The front entrance used by the Congressists is ordinarily closed, except when the Queen enters to open Parliament. His Royal Highness the Prince Consort attended the first meeting, which was presided over by General Diehl. Upon the dais, in the great hall which was effectively hung with the flags of all participating countries, sat the officers of the Congress and the members of the Permanent Committee facing the official delegates and members.

The official languages were French, Italian, Spanish, and English.

THE PERMANENT COMMITTEE

THE PERMANENT COMMITTEE

MEMBERS

President: Major General J. C. Diehl (Netherlands).
Secretary: Lieutenant Colonel Jules Voncken (Belgium).
Members:

Médecin-Colonel Malaspina (France).
Médecin-Colonel Filippo Caccia (Italy).
Médecin-Colonel Augustin van Baumberghen (Spain).
Commander William Seaman Bainbridge (United States of America).
Colonel-Pharmacien Jules Thomann (Switzerland).
Major A. D. Stirling (Great Britain).
General Dr. Ivo Soares (Brazil—not present).
Jonkheer Sandberg van Boelens (Netherlands—Local Secretary).

Honorary Presidents:

General Wibin [1] (Belgium).
General Della Valle (Italy).
General Vincent (France).
General Rouppert (Poland).
General Sir Matthew Fell (Great Britain).

MEETINGS OF THE COMMITTEE

In accordance with the system as followed at previous Congresses, a number of meetings of the Permanent Committee as a whole and its subcommittees were held before, during, and following the scientific sessions.

A report was made on the responses received from the various countries regarding their cooperation with and active support of the International Office of Medico-military Documentation. Up to date, France, Denmark, Poland, China, Lithuania, Netherlands, Belgium, Yugoslavia, Switzerland, Spain, and Rumania have agreed to cooperate fully and Norway will do so with certain reservations.

[1] Deceased.

Great Britain and the United States of America, while in full sympathy with the effort, have not yet joined because of lack of appropriation for that purpose. Under the heading of "International Office of Medico-military Documentation" in this report, will be found data regarding this whole effort.

The Secretary of the Permanent Committee made a report on the conference of the Commission of Standardization of Geneva, in which he assisted. The conclusions were adopted by the Committee.

The proposition to create a special section of administration in the Congress of Military Medicine and Pharmacy was overruled. It was decided that there are no distinct sections in the Congress. Questions regarding administration will be studied in the same way as are questions on dentistry, pharmacy, etc.

The proposal to hold the Congresses every three years instead of every two years was overruled.

It was decided to obtain from each country a list of names of those who have made distinguished contributions to military medicine, so that these may be kept on permanent record.

It was proposed and accepted that Colonel Voncken assist at the various Congresses solely as Secretary of the Permanent Committee and not as a Belgian delegate. The expense of this is to be carried by the Congress itself.

It was agreed that any communication which is not relevant to the subjects under discussion at a Congress will not be printed. It will be carefully read and utilized at a future Congress when that particular question is on the calendar.

The cordial invitation to hold the next Congress in Spain was unanimously accepted and in 1933 the delegates will meet in Madrid.

After careful deliberation the following subjects were decided upon for consideration at the Seventh Congress:

(1) General Principles Regarding Medical Services in War Time and Their Application to the New Rulings of the Geneva Convention. (Reporting countries: Spain and Sweden.)

(2) Preventive Vaccination in the Army, Navy, and Air Force. (Reporting countries: Spain, Great Britain, and Japan.)

(3) The Treatment of Surgical Cases of Primary Urgency at the Front, in a War of Movement. Specialized Formation—Its Material Organization and Its Employment from the Tactical Viewpoint. (Reporting countries: Spain and Belgium.)

(4) Preserved Foods as a Regular Ration in Peace Time or on the Field. Modes of Preparation. Analyses. (Reporting countries: Spain and Switzerland.)

(5) Comparative Study of the Organization of Dental and Administrative Services in the Different Armies, Navies, and Air Forces. (Reporting countries: Spain, Mexico, and Paraguay.)

SUBJECTS REPORTED UPON AT THE CONGRESS

RECRUITING, TRAINING, AND ADVANCED TRAINING OF MILITARY MEDICAL OFFICERS AND PHARMACISTS

OFFICIAL REPORTS

Sedée (Dutch Indies).

Following an account of the recruiting, education, and training of the military medical officers and pharmacists in his own country and its colonies, Capitaine-Médecin G. A. Sedée, Army of the Dutch Indies, proceeded to point out the discrepancies between his and other countries and to depict, from his viewpoint, the ultimate ideal. In view of the notable existing differences, a separate discussion was devoted to the Military Medical Service in the Netherlands and in the Dutch Indies.

The military surgeons and pharmacists of the Dutch Army can be divided into two groups: (1) medical officers and pharmacists of the active service; (2) medical officers and pharmacists of the Reserve. After having passed the medical or pharmaceutical examination in one of the four universities of the Netherlands, surgeons and pharmacists may enter the Army. They must be of Dutch nationality and physically fit for military service. The newly recruited surgeons are then occupied for some time in a military hospital, where they learn the military peculiarities of their future profession.

In 1930 the School of Military Surgeons of the Reserve was established at The Hague, for the purpose of providing a more technical education. This school is comparable, in part, to the Application School of the Medical Service in France, Belgium, and elsewhere.

No distinction is made in the Dutch Army between the medical officers who follow their career in the laboratories or hospitals, and those who function as regimental surgeons. The Dutch Army has specialists in surgery, ophthalmology, otolaryngology, venereal, and cutaneous diseases, psychiatry, internal diseases; there is also an Army hygienist. With the exception of the latter, they are connected with the Central Hospitals of The Hague and Utrecht, where transportable sick soldiers are sent from the other garrisons when their condition requires the care of a specialist. The military pharmacists, aside from their pharmaceutic occupation, carry out

chemical analyses for the military hospitals, in the military pharmacies.

In the *Dutch Indies* the corps of medical officers of the Colonial Army is much more numerous than that of the metropolis, for a notable portion of the Dutch Army is scattered throughout the entire Archipelago, in garrisons with several posts, almost all of which have military surgeons. These officers are obliged to serve in the Colonial Army for at least eight consecutive years, either as medical officers of the Army of the Dutch Indies, or in other analogous positions—as selected by the Government—belonging to the Service of Public Hygiene in the Dutch Indies.

On their arrival in the Dutch Indies, the young medical officers are placed in a large hospital in Java and here serve for about one year. In the course of this year, they are sent in detachments to Weltevreden, Batavia, where for four months, they take a course in tropical diseases. Besides having these theoretical lessons, they must serve in the large Military Hospital in Weltevreden, which harbors about four hundred patients of all classes and nationalities, and are thus afforded an opportunity to learn the language and customs of these various races. The course of tropical diseases comprises a purely medical and a medico-military part. After this first year in Java, which is almost entirely devoted to the education of the medical officers, the young military surgeons are transferred to some distant station in one of the other islands of the Archipelago. They usually remain in such a post from two to two-and-a-half years. This may prove the most trying time of their career, as, in view of the great distances and the absence of other medical men, they must depend entirely on themselves in the exigencies of a highly variegated practice. After working in a station of this kind, the surgeons are transferred to a hospital of one of the other islands of the Archipelago. Thus a period of two to three years in a remote station alternates with a period of the same duration in a large hospital. Upon the completion of six years of service in the Indies, a medical officer is entitled to a leave of absence of eight months in Europe.

After eight years of service as medical officer, second class (lieutenant), a surgeon is promoted to medical officer, first class (captain). Promotion to the rank of major, first class, follows for selected men, at the end of about fifteen years. It is noteworthy that the years of service in the Indies count double as compared to the years of service in the Netherlands (for example, when the officer is transferred there or on leave of absence).

In the Army of the Dutch Indies, as in the Netherlands, the right of private practice is extended to the military surgeons, but they are forbidden to utilize military apparatus or instruments for such use.

In the Army of the Dutch Indies, all civilian surgeons, who are attached to the military service, are nominated Reserve medical officers, provided they are physically fit. During the year which follows their nomination, they must serve two weeks and then for two weeks every three years. The Reserve officers of the Indies are attached to the military service until their forty-fifth year; they must be Dutch subjects; they can not belong to the native population or to foreign Orientals (Arabs or Chinese).

In *England* the corps of medical officers is composed of surgeons who have already completed their studies and who engage voluntarily in military service. The candidates may not be older than 28 years; they must pass a competitive examination and be physically fit for military service. Every young officer who has passed the examination, must take a 3-month course in the Royal Army Medical College in London, then a second 3-month course of instruction in the Aldershot Camp. The first course in London is a scientific one, consisting of lectures on war surgery, hygiene, pathology, tropical diseases, entomology, and on military legislation and administration in peace and war. The second course assumes a more practical character and comprises military instruction, exercises, and horseback riding. At the end of these two courses of three months each, the young medical officers must pass an examination. Besides the medical officers of the standing Army, England also has her medical officers of the Territorial or Colonial Army and a corps for the education of medical officers, composed of medical students. The training of the two latter groups consists in periodic examinations, lectures, and a fortnight's period in camp.

At the end of about ten years of service, every medical officer must take a repetition course of five months. This course comprises war surgery, tropical pathology, and hygiene. It is given in the form of lectures, practical laboratory, and clinical work in a large London hospital. At the end of this course, an examination is taken before the professors of this institute and of other centers.

As in the Dutch Army, the British medical officers are permitted to engage in civilian practice, under the condition that the military service does not suffer; but here again, they may not make use, for their private clientele, of hospitals and instruments belonging to the Army.

A peculiarity of the British Army, which differs from the custom in Holland, consists in the fact that there are no military pharmacists who are commissioned officers. The necessary pharmaceutic work is done by noncommissioned officers, who have passed a special examination in this branch. The more scientific examinations and analyses are made by medical officers who have specialized in hygiene and bacteriology.

In *Belgium* medical and pharmaceutic students who have passed an examination in the natural sciences, may apply each year for admission to the Officers' School of the Medical Service. Before they are accepted they must undergo an examination in physical exercises. The conditions are not strict and all normally developed individuals can pass. This part of the examination is supplemented by a test concerning the knowledge of the two national languages—Flemish and French. Candidates who fail are excluded from participation in the second part of the examination—the scientific, which is composed of chemistry, physics, geology, botany, and zoology. Those who pass are admitted as students of the school.

The School of Medical Officers is composed of four sections having their seat in the four university towns of Belgium, generally in the military hospital of the town, where it occupies a dormitory, a refectory, one or several study halls, and a recreation hall. The medical or pharmaceutic pupils may choose at which of the four sections they wish to study. The course takes five years for medical officers and three years for military pharmacists. During these years, the pupils are obliged to take, in addition, military and gymnastic exercises under the guidance of military teachers, and to learn horseback riding. During the first two years, they are subjected to military discipline. This, in the author's opinion, is an important factor, favorable to good training, and is lacking in the British Army and, in part in the Dutch Army, where it was formerly in force. At the end of every year, the students must pass an examination. On the termination of their studies, namely, after obtaining the diploma of Doctor of Medicine, or Pharmacist, the young medical officers or military pharmacists must take a supplementary course of four months in the School of Technical Instruction of the Officers of the Medical Service. This school is established in Brussels and connected with the military hospital there. At the completion of the four months, the pupils must pass an examination in the subjects studied in the course, and, based on the number of points obtained, they receive a rating. This rating is of great importance during their entire career as medical officers or military pharmacists.

As in Great Britain and the Netherlands, the Belgian medical officers have the right to civilian practice, without being permitted to make use of the military hospitals and their instruments. The military pharmacists do not enjoy this privilege. The young medical officers may be incorporated in the troop or attached to the service of the military hospitals, but no distinction is made between the two groups. The promotions of medical officers and military pharmacists are not made selectively, but according to the length of service.

In *Czechoslovakia* the graduating physicians may at once become medical officers, provided they are found physically fit for service and sign a contract for five years. They must take a 2-month course of training in the Military Medical School. At the termination of this course, they must pass an examination and are classified according to the number of points obtained. This rating is retained until promotion to the next higher grade. The two best pupils of the Military Medical School may choose the garrison where they wish to be placed. The military pharmacists are recruited from the Reserve and there exists no special preparation for their functions. The medical officers are allowed to engage in private practice, provided the military service is not impaired. Private patients of medical officers can not be admitted to the military hospital without special authorization by the chief of the hospital. After leaving the Military Medical School, officers are obliged to pass the first two years of their service in the military hospitals, after which they are sent to the regimental service. Medical officers and military pharmacists may be promoted up to the rank of lieutenant colonel without examination or competitive tests. In order to attain the rank of colonel, it is necessary to take a 7-month course followed by a competitive examination.

The medical officers and military pharmacists of the Reserve, summoned for military service, are obliged to take a course of six months in the School of Medical Officers of the Reserve. At the end of this course, they must pass an examination and are given the rank of sublieutenant. They discharge their military duties in one of the military hospitals or with the troops for one year. They are then still subject to periods of exercises, which total fourteen weeks.

In *Brazil* the recruiting is done among physically fit and otherwise qualified physicians and pharmacists who have just terminated their studies. They must take a severe competitive examination, consisting of three parts: a written test, an oral test, and a practical test. The candidates are classified according to the number of points obtained in this examination. They must follow a training-course of ten

months in the Technical Training School for Medical Officers. During this course, they undergo an examination every three months, and, at the termination of the course, must pass an examination covering all the subjects taken up. The ratings obtained have a great importance for the officer's future career.

The medical officers and military pharmacists may employ their leisure for private practice, provided the interest of the service is not impaired.

Promotions, up to the rank of captain, take place in Brazil according to the length of service. Beyond the grade of captain and including that of colonel, the promotions are made, in part, according to the length of service and, in part, selectively. Promotions to the higher grades depend solely on the choice of the Government.

In *France* medical students who have passed their first examination are admitted to the Military Medical School in Lyon, after they have been passed as physically fit for military service and have participated in a competitive examination. This also applies to the pharmacy students. Graduate surgeons and pharmacists are given the rank of sublieutenants, and their classification is made according to the number of points obtained in the final examination. They are given service in the military hospitals of the university towns, and not until the following year enter the Application School of the Military Medical Service of the Val-de-Grâce, in Paris, where they take a training course of nine months. The competitive test at the end of this course determines their rating. In the French Army, the military surgeons and pharmacists have the same privileges and the same duties as the other officers. Engagement in private practice is absolutely forbidden to the military surgeons; they may assist their civilian colleagues by their advice, but can never enter into competition with them. This is a very important point of the French system and, to the author's knowledge, France is one of the few countries where private practice is forbidden to the military surgeon.

French military surgeons may specialize in all possible branches of their profession. These special studies last, at most, three years, but meanwhile the military duties must always be discharged. Military surgeons as well as military pharmacists may specialize in a definite branch and be designated by the Government to serve as professors or *aggrégates* of the Val-de-Grâce Institute.

In the French system, promotions in the lower grades are made according to the length of service, but after the rank of lieutenant colonel, promotions are selective.

The French system has intentionally been described last, because it seems the most nearly perfect to the author. The prohibition of private practice for military surgeons, especially, is a factor of great importance for the good functioning of the Service and the cultivation of the *esprit de corps* of the military surgeons. But there are countries, and especially the colonies, where this interdiction would meet with practical impossibilities, namely, where there is generally a dearth of medical personnel with respect to the needs of the civilian population. On the contrary, there are other countries where there is an abundance of physicians, many of whom lead a precarious existence. In such countries, the interdiction of private practice seems, to the author, a necessary condition for the good functioning of the Military Medical Service. Aside from this point, the French system is entitled to credit for the training of the personnel, as there is a school of medical service in Lyon, where from the beginning of their studies, the medical and pharmaceutic students receive military instruction and participate in military exercises.

Colonial Army—Dutch Indies

Every year, a certain number of young men are accepted by the Colonial Ministry, under definite conditions, to be prepared for the position of medical officers in the Army of the Dutch Indies. This acceptance includes a certificate of access to the medical faculty of a Dutch university, for study and examinations. The officers are obliged to remain in the service of the country for at least eight consecutive years, dating from their arrival in the Dutch Indies, acting either as medical officers in the Army of the Dutch Indies, or in other analogous positions of the Service of Public Hygiene in the Dutch Indies, selected by the Government.

The instruction in the Dutch universities comprises only the study of medicine, without any military preparation. The education and advanced training of the men as medical officers takes place after their arrival in the Dutch Indies. The cardinal point of this supplementary training of the newly nominated medical officers is a 4-month course in tropical diseases given in the Military Medical Laboratory in Weltevreden, Batavia, which harbors, on an average, 350 patients of all classes and nationalities, not only soldiers, but also many women and children. While taking this course, and also during their service in the military hospital, the medical officers receive their military preparation and their tactical medical training. The hospital service takes place either during the course or after, or before and after.

The course in tropical diseases consists of a medical and a military portion, the latter given entirely in the form of parleys. At the termination of the course the young medical officers make scientific excursions for a fortnight to learn the application of scientific principles to practical purposes in the domain of hygiene, sanitation, quarantine and epidemics, fight against malaria, disinfection of ships, and water analyses. A day is devoted to practical military exercises (use of maps in the territory). These exercises are conducted by competent instructors and constitute a welcome diversion after the months of intensive theoretical and practical work. Next, the medical officers are alternately appointed to the military dentist of the hospital, so that later on, in small garrisons, they may practice dentistry. In certain cases, after the completion of the course in tropical diseases, special lessons are given on the fight against malaria. Finally, the medical officers are placed in a small garrison under the control of a regional first medical officer. They usually remain here for two years and are then sent to a more important post. At the end of four years they are again placed in a large hospital.

The military pharmacists of the Army of the Dutch Indies are recruited from the universities of the Netherlands. After having terminated their training in the Central Chemical Laboratory in Bandoeng and in one of the four large military pharmacies in Java, they are considered capable to fill the function of a principal pharmacist and administrator. As much as possible, the military pharmacists take part in military maneuvers and exercises, in order to acquire the necessary experience with pharmaceutic work in war time.

For a variety of reasons, the corps of medical officers and pharmacists would best be recruited from and supplemented by enlisting young medical and pharmaceutic students, who could take up their studies in a military medical school. The medical and pharmaceutic studies in this military medical school must be equivalent to the corresponding studies in a university, and during the leisure hours the military sciences should here be taught and physical training such as horseback riding given. During the summer vacation the future surgeons and pharmacists might serve for a few weeks in the troop and thus learn to know the soldier's life.

An international exchange of military surgeons and pharmacists is proposed, with each detachment from one country to another remaining a year or two. On their return, the medical officers might

submit a report on their experiences and express their opinions for the use of the Directorate of the Military Medical Service of their respective countries.

Conclusions

(1) Training of medical officers should begin with the commencement of their university studies, preferably in medico-military schools, as in France.

(2) After passing the qualifying medical examination and being appointed M. O. (medical officer), the officer should be posted in a large military hospital; in no case may the young medical officer be immediately employed in a garrison where he is alone or in which there is no military hospital.

(3) Further training should primarily take place in a school for medical officers, and, in addition, by attendance at exercises on the map and on the ground, with the cooperation of staff officers, and by periodic attachments to large military or civil hospitals.

(4) It is desirable that the instruction in military medical tactics in institutes for higher military education should be entrusted to medical officers and that, annually, a number of such officers, considered suitable, should follow a part of the course at the Staff College.

(5) It is desirable for the higher education of the medical officer, that he be enabled to make a study of the organization and functioning of the medical service in foreign countries, both in a central office of medico-military documentation and by attachment to other armies.

(6) In the interests of the formation of an efficient corps of medical officers, it is desirable that they be prohibited from practicing among civilians, except in cases where this is impossible owing to lack of medical practitioners among the civilian population; and that the financial and scientific position of the medical officer be made sufficiently attractive to permit a restricted choice of the best candidates for the service.

Yovanovitch and Georgevitch (Yugoslavia).

The survey of conditions for the recruiting of medical officers in France, Belgium, Poland, Greece, and Yugoslavia, made by Medical Lieutenant Colonel Radmilo Yovanovitch and Medical Commandant Alexander Georgevitch, of the Medical Service of the Yugoslavian Army, clearly shows that such recruiting, by means of the Officers' School of the Medical Service, is a procedure greatly

superior to the direct incorporation of civilian physicians and pharmacists in the Military Medical Service. This method results in the obtaining of better military surgeons and pharmacists. Moreover, it permits the giving of very complete, very systematic military and medico-military instruction, which better prepares the officers for army service. Finally and particularly, a special mentality is created by means of this method, a mentality of military surgeons and pharmacists, which, in all respects, exerts a favorable influence upon the service. The prospect of a guaranteed career, with regular studies at the expense of the State, induces a sufficient number of candidates to compete, among whom there is the possibility of selecting the best. The very atmosphere of the school imbues these young men with the taste for work. The military education, starting from the first days of their medical studies and continuing for their entire duration, certainly yields very good results.

Whether coming from civilian environments or from the Officers' School of the Medical Service, the young military surgeon or pharmacist is not capable of giving all that can be expected of him in the Army. He is without military or medico-military knowledge, as he has not been able sufficiently to acquire this in the course of his medical studies. Medical instruction is similar in all countries. Military medicine has special chapters in several branches of medicine, which are necessarily omitted in university courses, as they can not be introduced in the already overcrowded curriculum. The Medical Service itself is, therefore, obliged to give, by its own means, this supplementary instruction to the future medical officers, together with purely military training. This double instruction, military and medical, can be carried out only in a medico-military school.

In France, Belgium, and Greece, where there exists an Officers' School of the Medical Service, all military surgeons and pharmacists coming from this institution pass through the Application School, before beginning their military career; in Belgium and Greece, this is done as soon as the university studies are terminated; in France, after one year's service in the military hospitals of the faculty towns. In the countries which have no Officers' School of the Medical Service (Brazil, Great Britain, Italy, Czechoslovakia), civilian physicians are directly admitted to the Application School. This admission almost invariably takes place after a competitive test, preceded by a medical examination. The duration of training in the Application School is not the same in all countries, varying from six to ten months. The program of studies, likewise, differs

according to special requirements in the different countries. In a general way, this program comprises:

(1) Military instruction, medico-military and administrative;
(2) Medical instruction (theory and laboratory); military hygiene, epidemiology, legal medicine, bacteriology, tropical pathology (Italy), and entomology (Great Britain);
(3) Clinical instruction with special reference to " military diseases " in peace time and during war.

The young military pharmacists also enter the preparatory school in those countries where it exists. In those countries which have no Application School, the supplementary and medico-military training is given to the young medical officers either during or at the end of their medical studies. In Poland, which has an Officers' School of the Medical Service, the Application School is replaced by a year's service in the Central Military Hospital, which is connected with the Center of Medical Instruction.

In order to comply with its purpose, the Application School must be essentially practical and impart to its pupils the medical, medico-military, and military knowledge ultimately necessary for their duties in the army. Its program must include medical, military, and administrative instruction. To ensure the best possible teaching conditions, the school must possess the necessary technical equipment, laboratories, a dissection room, and a good research library. The medical instruction comprises a clinical (curative) branch and a preventive (prophylactic) branch. The latter covers military hygiene and epidemiology, and must be supplemented by teachings of bacteriology and serology. Altogether, with the complementary practical lessons, the instruction in the Application School should last twelve months. The teaching personnel of the school is composed of professors, who are also chiefs of service in the Military Hospital Annex of the school, and their assistants. The military and administrative instruction is imparted by officers, professors in the Military School. The professors and adjunct professors must limit themselves to the teaching-end, and must not be transferred during the entire time they are charged with this duty.

A properly organized Application School, with a good teaching personnel and with sufficient technical means should, in the authors' opinion, entirely meet the desired purpose of training young physicians to whom medical service in the army may be entrusted. This is also applicable to the military pharmacists, as well as to the professors of the section of pharmacy.

The training of Reserve officers of the Military Medical Service is of great importance for a modern army, and there should be a special school for this purpose. The theoretical and practical teaching must comprise:

(1) Instruction of the soldier;
(2) Medico-military instruction; organization of the Medical Service during peace and in war; its functioning;
(3) Medical instruction.

Classification of the Reserve military surgeons is made by means of an examination at the end of the period of instruction. Before becoming medical officers, the candidates should be posted to the regiments and sanitary stations to acquire practical knowledge and become accustomed to military life and army work.

In the various countries, the training of Reserve military surgeons and pharmacists is conducted according to general principles, with differences of modality and duration. Aside from the courses in the training-schools, the Reserve officers are obliged to take periodic courses of instruction.

The advanced training of medical officers, recruited and educated as shown in the foregoing, requires a complementary professional instruction in the army itself, as so far these officers have acquired only the elements of the medical and pharmaceutic sciences. This elementary knowledge must be extended and completed, especially by practical experience. True professional value can be retained only through continuous improvement, by keeping abreast of the progress of science and by personal collaboration. This is the path to be followed by the Medical Service, in order that it may grow in the esteem of military chiefs and acquire sufficient authority for the realization of its program of military hygiene and prophylactic medicine.

The training of specialists differs in the various countries and, in the majority of the cases, is even left to chance and to the personal initiative of the medical officers. Conditions for specialization in the army are still less favorable for military pharmacists than for military surgeons. The actual status of the medical sciences renders specialization an indispensable condition of all constructive and scientific work. Modern wars, with their special characteristics and the great numbers of mobilized soldiers, demand from the Medical Service of the present day, not only expert surgeons, but also skilled specialists. For these reasons, great improvements must be made in the methods of advanced training of medical officers. This is not

only a vision of a few idealists, but an urgent necessity which is felt more and more in all the armies of the world. The young military surgeons acquire the elements of the medical sciences in the universites, and the indispensable military and medico-military data in the Officers' School of the Medical Service. This knowledge is extended and confirmed in the Application School. Finally, a period of time with the troops makes the thus trained medical officers well acquainted with the life and needs of an army. It is now, after this period of preparation, that a great and necessary bifurcation must be provided for in the career of the military surgeon. By means of severe competition, a selection of the necessary number of young medical officers should be made to fill the hospital service. These men will specialize in the different branches of medicine, to take their place in the various services of the military hospitals. Beginning as assistants and then becoming chiefs of service, they will remain in the service until the end of their career. The other medical officers will make their whole career outside of the hospitals. The authors emphasize that they are firm believers in this bifurcation in the career of military surgeons. It seems to them an absolute necessity and a primary condition for the complete education and advanced training of high-grade military surgeons.

Service in the troops and in the administration must not be regarded as less important than service in the hospitals, for it likewise requires efficient surgeons and conscientious workers. The Military Medical Service must follow the spirit of the time, which everywhere demands specialization and constant improvement, in order to arrive at the maximum of efficiency and to secure the best results. By placing efficient specialists in all the services, in the hospitals and outside of the hospital, the Directorates of the Military Medical Service will obtain the maximal rendering and safeguard the good functioning of the service in the crucial time of war.

The specialization of military pharmacists is, likewise, a necessity for the modern army. Properly sustained, encouraged, and stimulated, the military surgeons and pharmacists will be enabled to render the greatest service to the army, while guaranteeing a certain authority and undeniable prestige to the Medical Service.

Conclusions

The efficient functioning of the Medical Service, its progress and its future, constitute a problem, the importance of which is of a military and national interest. This problem may be envisaged from three points of view, namely, the recruiting, training, and advanced

training of medical officers and pharmacists. The position of medical officers and pharmacists in the army is an incidental question, but is closely bound up with the subject.

(*1*) *Recruiting of medical officers and pharmacists.*—Recruiting is effected in two ways:

(*a*) By the direct incorporation of civilian medical men and pharmacists, selected, in the majority of cases, by competition, who are generally sent to a "School of Application".

(*b*) By preliminary education of the future medical officers at a Medical Officers' School. The students of this school, Bachelors or students of medicine in their first years of study, are selected by competition. The school imparts the military and medico-military instruction, while the professional instruction is given by the faculty.

The latter mode of recruiting seems greatly preferable to the former, as the candidates receive their military education at the same time as their purely professional training; furthermore, by virtue of the military education, a special mentality is developed among these young men, which better prepares them for dealing with the problems of military medicine.

(*2*) *Education of medical officers and pharmacists.*—Service in the army requires of medical officers and pharmacists not only the possession of all requisite military and professional knowledge, but also the possession of a perfectly developed military personality. It is with a view to acquiring this training that the future medical officers and pharmacists, whether they come from the Medical Officers' School, or from civilian centers, are obliged, in almost every country, to pass through a special school, known as the School of Application. The students here receive an education supplementing their medical knowledge, by adapting it to the requirements of the army. This school, at the same time, gives them the indispensable military and medico-military education which prepares them for service in the army. The instruction, the duration of which varies in different countries from six to ten or twelve months, comprises generally three parts:

(*a*) Military, medico-military, and administrative topics;
(*b*) Preventive medicine; hygiene, epidemiology, deontology, and forensic medicine;
(*c*) Curative medicine, i.e., clinical instruction in hospitals.

As regards the program of the school and more particularly, the clinical instruction, it seems necessary to make the following observation: Since regimental service requires, on the one hand, a well-developed clinical sense and, on the other, an adequate knowledge of preventive medicine, it is desirable that the program of instruction in this school be developed in both these directions, and that in all countries, clinical instruction and instruction in preventive medicine form a simultaneous part of the program.

The course in the School of Application terminates with a competitive final examination and classification of the students.

The training of military pharmacists is organized on the same principles.

The instructors at the school are specialists, selected by competition or appointed by ministerial decree.

The knowledge acquired in the School of Application should be completed by a tour of duty with an army unit, under the direction of a medical officer in regular charge of this service.

The training of Reserve medical officers and military pharmacists usually is carried out in a special school, or in a course of application. The program includes complementary medical and pharmaceutical instruction, as well as strictly military training. This two-fold instruction should be entrusted to competent medical officers, specially prepared for these duties.

(*3*) *Advanced training of medical officers and military pharmacists.*—In most countries, young surgeons leaving the School of Application are posted to army units. Regimental service is indispensable for medical officers if they are to become acquainted with army life and its needs. At the end of this period of service with a unit, a certain number of medical officers spend a term in a civil or military hospital, in order to specialize in the various branches of medicine. According to the information collected by the authors, there does not exist in any country but Poland, a distinct differentiation between the medical officers employed in military hospitals and those who make their career with army units and in the administration. However, the actual status of medical sciences and the requirements of the army demand that a strict differentiation be made between medical officers employed in military hospitals and those who serve with the troops or in the administration, so that each may be enabled to perfect himself in his service. This differentiation should commence, for young medical officers, as soon as they have completed their first tour of duty with the troops.

(*a*) Medical officers for military hospitals: This specialization should take place in the center for specialization and advanced training of medical officers, which is generally found at the Central Military Hospital. Efficient organization of the theoretical and practical instruction, directed by chiefs of services, is the primary condition for success in this specialization. This finishing course concludes with an examination, which entitles the successful student to the rank of specialist of the military hospitals and guarantees that he will be able to spend his entire career in a hospital.

(*b*) Medical officers with the troop and in the administration: These men take their finishing course in a High School of Medical Service, organized in the School of Application. This course comprises: military subjects, such as strategy, tactics, military geography; administrative subjects, such as legislation, regulations, circulars; sanitary subjects, such as sanitation, administration of military hospitals; and finally, medical subjects, such as hygiene, epidemiology, preventive medicine, statistics. This higher course terminates with an examination, with classification opening the way to appointments as regimental M. O.'s, divisional M. O.'s, and chief M. O.'s in military hospitals.

The specialization of military pharmacists should, likewise, take place in a finishing center. Well-organized instruction should give them the necessary knowledge to prepare them for the discharge of their functions as dispenser-chemists.

The further training of medical officers should be effected by their personal work, stimulated by the Directors of the Medical Service, through optional competition and awarding of prizes. Hospital M. O.'s should be sent, from time to time, to university clinics at home and abroad, in order to keep abreast of new achievements in their specialty. Regimental and administrative medical officers should also go abroad from time to time to acquaint themselves with the organization and functioning of the medical services of other countries. Their higher military instruction should be completed by a course at the Staff College. This course should be a condition of entry to the highest functions of the Surgeon General's department.

These diverse and repeated ways of encouraging members of the service to progress in their profession, combined with judicious selection, should result in the creation in the medical service, of an intellectual élite. This fact itself will add to the prestige of the medical service and increase its authority in the army.

(4) *Position of medical officers and pharmacists in the army.*—In all armies, military surgeons and pharmacists rank as officers, with all the corresponding privileges and obligations. Special allowances are granted to medical officers, in certain countries, such as, grants in aid of study or research work in the specialties, indemnity for special functions of extreme importance and involving great responsibility. This principle of special grants and allowances would seem to lend itself to adoption in all countries.

The problem of civilian practice has not been uniformly solved everywhere. It is, however, in the interest of the medical service that army medical officers should be authorized to treat civilian patients, this being one way of enabling them to increase and perfect their knowledge, while acting, at the same time, as a stimulus to greater personal activity.

COMMUNICATIONS

Lanne (France).

Médecin-Général-Inspecteur E. Lanne, Président du Comité Consultatif de Santé, France, shared the opinion expressed in the official reports on the recruiting of military surgeons and pharmacists; but he differed as to the exclusive assignment and definite specialization of hospital physicians or surgeons on the one hand, and on the other, of regimental medical officers or those of the Administrative Service. The two methods, early recruiting of students and the late recruiting of graduates in medicine, have been tested in France. The resulting experience is altogether favorable to the first system, and to the placing of the students in a single school, in order to obtain a good average of medical education, to create a "mentality" for the future military surgeon, and to invest him with the *esprit de corps*. From 1852 to 1885, the method of bifurcation and definite specialization was applied. During this period, a corps of hospital medical officers was instituted, destined exclusively for hospital practice, but this plan was abandoned as undesirable. At the present time, the physicians and surgeons of the military hospitals, as well as the adjuncts and professors of the Val-de-Grâce, are obliged to attain a grade in the troops or in an administrative capacity, before being promoted to the higher grades.

In regard to the question of improvement of the financial situation of military surgeons and pharmacists, either by authority to engage in civilian practice or by the granting of special fees—such problems may be satisfactorily solved by a sufficiently high percentage of medical officers of the higher grades. The various viewpoints con-

cerning the moral, social, and material situation of the military surgeon may thus be conciliated by the application of the Hippocratian formula: Honor, decus et argentum.

Vansteenberghe (France).

In his communication on *The Recruiting, Education, and Advanced Training of the Administration Officers of the Medical Services of the French Army*, Captain of the Reserve Administration, Vansteenberghe, Doctor of Law, Member of the Directing Committee and Delegate of the Friendly Union of Reserve Administration Officers of the Medical Service of the French Army, stated that with special reference to advanced training, one of several schools for the improvement of the Medical Service is organized in each military region of France, in order to develop the instruction of the Reserve officers of this service, outside of the so-called convocation periods. These schools are under orders of the Commanding General of the region, but because of the technical teaching here given, likewise are under the Director of the Regional Medical Service. In the provinces, these schools are directed by a superior medical officer, appointed for this purpose, and the majority of these are usually officers of the Medical Service, whether they be surgeons, pharmacists, dentists, or administration officers. The instruction, the object of which is to render the Reserve officers more and more familiar with all the details of their eventual duties on mobilization, is distributed over a cycle of three years, and comprises about twenty sessions annually, in the form of conferences and practical exercises, or demonstrations of material, some given, and others directed by officers of superior military training, by regular officers of the Medical Service, or by Reserve officers of this service, properly qualified for this purpose and appointed by the director of the school. In Paris, there exist distinct schools of advanced training for the different branches of the Medical Service, and, notably, a special School for the Reserve Medical Administration Officers under the direction of the Bureau of the Directing Committee of the Réunion Amicale. At the beginning of 1931, the Réunion Amicale, which for a long period of time supplied such schools with instructors and whose continuous propaganda led many to profit by this opportunity to improve their practical military knowledge, instituted a "Committee of Advanced Training Schools", destined to contribute still more actively to the development of these schools of the Reserve administration officers of the Medical Service and to the instruction given therein.

Ryan (Great Britain).

In his communication on *Recruiting and Training of Territorial Medical Officers of the British Army*, Lieutenant Colonel J. E. N. Ryan, T.D., M.D., R.A.M.C. (T.A.), Great Britain, stated that medical officers of the Territorial Army are appointed to commissions as lieutenants in the Royal Army Medical Corps (T.A.) from candidates registered under the medical acts in force in the United Kingdom. Officers of the hygiene companies need not necessarily be medical men, but must be conversant with sanitary science. All must be under thirty-two years of age and pass the same physical examination as combatant officers. Officers are appointed in one of the following categories:

(*a*) Administrative branch;
(*b*) Field and cavalry field ambulances;
(*c*) Combatant units for general medical and sanitary duties;
(*d*) General hospitals;
(*e*) Hygiene companies.

An officer, on appointment, may choose the unit with which he wishes to serve, provided there is a vacancy in the establishment. Those who have passed certain examinations as cadets are given three to six months seniority. The training is divided into initial and subsequent training, and consists of obligatory training and examinations and voluntary courses of instruction, the general object being to give officers an opportunity to attain a sufficiently high standard of proficiency so that the personnel of the R.A.M.C. (T.A.) may be able to take its place by the side of the Regular Army on mobilization. The examinations are conducted with a view to ascertaining that officers have acquired a knowledge of military training in all its branches under a strict training system.

Before promotion to the rank of captain, at the end of three-and-a-half years' commissioned service, an officer must pass an examination in the solution of medical tactical problems with an army operating in the field, embracing a knowledge of the other arms of the service, field service regulations, map reading, and military hygiene. A captain is eligible for promotion to the rank of major on completing twelve years' commissioned service, provided he is recommended by his superior officers and passes a further examination showing his capability of appreciating a military situation, making decisions in the solution of medical tactical problems arising on active service in the field, and issuing brief, clear, and rapid orders in connection with them. The examination also tests the knowledge of the candidate in

the administration of the medical services of the Army and the preservation of the health of the troops on active service. Promotion to higher rank is by selection or seniority from officers fully qualified in the theory and practice of this system of training, and who are capable of imparting their knowledge to the personnel under their charge.

Van Baumberghen (Spain).

In his communication on the *Recruiting, Training, and Advanced Training of Military Surgeons: Technical Aspect*, Teniente Coronel Médico A. van Baumberghen of the Spanish Army, covered the following points. The Military Medical Service must possess an organization in peace time capable of passing rapidly to a war footing. It is difficult to give general rules for the recruiting of military surgeons; this is subordinate to the military organization of each country. We must limit ourselves to the expression of desires in favor of those systems which we consider preferable. The medical education of officers of the Medical Service must be the most complete possible and should benefit by recent discoveries in the different countries. It is absolutely necessary for the Military Medical Services to keep constantly abreast of the progress attained in the medical sciences, in order to apply this progress to the benefit of the military community. Keeping in mind the special characteristics of this community, medico-military Application Schools are absolutely necessary. Two kinds of instruction must here be carried out:

(*a*) Training of the officers of the Medical Service immediately upon their entrance into the military service;
(*b*) Advanced training of these officers in their different branches during their military life.

The basis of advancement in medical studies rests on specialization and stability. Without underestimating the importance of all specialties, it is necessary to emphasize the priority of importance of teaching the organization of the Medical Service in the field, which must be considered as an actual science of application. In order to achieve a complete knowledge of all the specialties, advanced courses of instruction must be organized for each of them. These courses should be held in the best medical institutions, provided with the most competent personnel. So far as possible, these institutions and personnel should belong to the Military Medical Service.

It is necessary to obtain from all the governments their consent to the exchange of military surgeons. This exchange has been proposed

by the International Office of Medico-military Documentation and will give to all armies the benefit of the personal experience of the individual surgeons of each army.

De Bernardinis (Italy).

In his *Comments on the Medical Service in the Armies*, Tenente Colonnello Medico Dr. Virginio de Bernardinis of the Military Hospital in Rome, Italy, summarized as follows: This service must correspond to and comply with the requirements of the armies, which vary in different countries. Contingencies of a political, social, and financial type enter into consideration. In view of the impossibility of describing the methods followed in each nation, the author gave examples of the typical management of the various services, emphasizing in general outlines the most significant peculiarities and discussing the structural features, in an effort to discover some points which may serve in common in the settling of this grave question.

Castillo Najera (Mexico).

Following a sketch of some older historical data, Francisco Castillo Najera, Médecin-Général-Chirurgien, Professor of the Medico-military School of Mexico, stated in his article on the *Recruiting and Training of Military Surgeons: Some Data on the Medico-military School of Mexico*, that the inauguration of this school in Mexico City took place in March of 1917 and the establishment now enjoys a well-earned reputation throughout the country, for it has proved that it fills the purpose for which it was designed and created. In this new institute, the pupils receive intrinsic medical instruction and are imbued with the military spirit which is indispensable for the accomplishment of their future mission. In 1922, the first medical officers completely educated in the school were graduated and, up to date, it has produced ten generations of an approximate number of three hundred. The students reside in the establishment and are subject to military régime. At their entrance, they are privates; corporals at the end of the first semester; sergeants in their second year; and then follow the regular scale until they become captains after the examination of the last year. Upon receipt of their medical degree, they are ranked as majors. The title, conferred by the Ministry of War, invests them with the power of exercising their function as civilians, and is valid in the entire Republic. Their engagement comprises a duration of three years. Many continue in the Military Corps.

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Aside from the requisite aptitude for military service, it is necessary for those seeking admission to the school, to have followed, in an official institute, the preparatory studies required by the National University for medical candidates. The total number of pupils in the school is about 125, the maximal figure having been fixed at 150. The courses thus have not more than thirty students, which is a great pedagogic advantage, as is also the training in the hospital. During their studies, the pupils help in the services of the garrison of the Capital and occupy auxiliary posts, or participate in the ambulance services or other military functions. The future surgeons are in constant contact with other military establishments, so that they find themselves in a medium with which they are familiar, on the day when they begin their service. The studies last five and one-half years; the last semester is reserved for internist work, practical embalming, and orthopedic clinics. During their internship, the men prepare their theses and get ready for their professional examination. Throughout the last three years, the students practice in the different wards, cabinets, and laboratories, so that they become general practitioners of practical ability. As the number of applicants increases every year, and may be calculated as exceeding four times the available positions, a selection of the best is possible. The successive examinations permit a further selection and the student who fails in more than three branches of the course, is eliminated. The proportion of rejections is very small, and actually insignificant, after the second year.

Rafael Roldan (Spain).

Pharmacien-Major Dr. Guerrero Rafael Roldan of the Spanish Army, proceeded to show, in his communication on the *Recruiting, Instruction, and Advanced Training of Military Pharmacists*, the standards to be adopted. In Spain an oral examination is held in five subjects: natural history and pharmaceutics; physics and inorganic chemistry; organic chemistry; practical pharmacy; hygiene and analysis, with the practical performance of a chemical analysis. A written examination follows in natural history, physics, chemistry, and bacteriology; the recognition and identification of various pharmaceutical materials and products, with experimental demonstration of the characteristic properties of the material or product, and a statement as to whether it is altered or adulterated. A pharmaceutic prescription must also be filled. The accepted candidate enters the Academy of Military Pharmacy, an exclusively pharmaceutic insti-

tute, dedicated to the teaching of this specialty. The following subjects are here taught by professors of pharmacy:

(1) Military organization; including the organization of the Army, military instruction, and the organization, functions, and material of the pharmaceutic services, in peace as well as war time.

(2) Hygienic chemistry; chemical experiments related to Army hygiene, with respect to water analysis as well as articles used or consumed by the Army. Disinfection and bacteriological analysis likewise belong under this heading.

(3) Toxicological chemistry, including the toxicology and pharmacology of war gases; study of their chemical varieties; their recognition and analysis; protection against poison gases, individual as well as collective.

(4) Horseback riding and fencing taught by special professors.

At the termination of the course, the students must pass an examination in each of the first three subjects, and the average credit obtained serves for the determination of their graduation and military rank.

Annual specialization courses should be organized for the advanced training of military pharmacists, to be given in the Central Laboratory of Medical Organization, consisting of three classes:

(*a*) Chemicopharmaceutic industry, comprising the theoretical-practical studies with respect to the fabrication of chemical and pharmaceutic products, also new articles of general utility or economic advantage; in a general way, of products useful or necessary for the Army.

(*b*) Field service: Study and practical application of all the services to be filled by the pharmacist in war time, such as analysis of beverages and food, as well as disinfection and hospital treatment. Very simple and rapid procedures must be used, as advisable in war time, always utilizing the so-called field material.

(*c*) Toxicology and pharmacology of war gases, with special reference to the theoretical and practical study of the substances employed in so-called chemical warfare; their properties and toxic effects in man and animals; their recognition and analysis; finally, the methods for individual and collective protection.

Sanchez Gomez (Spain).

The Recruiting, Education, and Advanced Training of Military Surgeons and Pharmacists is considered by Dr. Joaquin Sanchez Gomez, Medical Lieutenant Colonel of the Spanish Navy, Professor in the Madrid General Hospital, as of extraordinary importance. He believes that the military strength of a country depends upon the efficacy and organization of its medical service. The selection, education, and advanced training of the medical officers on sea or land is a highly important task, not only from the military, but, eventually, from the humanitarian viewpoint.

With particular reference to the Naval Medical Service, the author stated that in Spain, as in a number of other countries, the medical graduates coming from the university, having been selected by competition and having passed the psychoanalytic tests, enter the Naval Medical School. Here they receive, in addition to their military training, special instruction concerning their duties on board warships, as well as in the regiments, arsenals, and other military posts. The naval surgeons, in connection with their duties may be classified in three groups, the first of which is outlined: General surgeon, with the grade of lieutenant and captain, having an intrinsic knowledge of naval specialties—naval hygiene; war surgery; asphyxiating gases; international sanitary legislation; tropical diseases; epidemiology; ordinance and legislation of the Navy; sanitary instruction, military and naval; legal medicine; psychiatry; laboratory methods.

The section of odontology must figure as a separate branch, for it has its strictly limited function, reserved for the treatment of diseases of the mouth and teeth. This branch should be consecutively studied in the different grades, but without in any way mingling with the general medical studies special to the medical corps of the Navy.

The following conclusions are offered to be discussed, or modified, if necessary, so as to indicate the plan to be followed in future, keeping in mind that above all our mission is humanitarian and that it is desirable that the wounded and sick in all the navies and armies of the world be cared for by a competent personnel, endowed with all the scientific means for their care and treatment.

(1) Surgeons of the Navy, with the rank of lieutenant and captain, once recruited, after passing psychoanalytical tests, should be instructed and educated along military and scientific lines, in the military-naval medical academies, to prepare them for their duties, as general physicians and surgeons on boats, hospitals, arsenals, marine infantry regiments, and other departments of the Navy.

(2) When they are nearing their promotion to chief, medical naval officers of the rank of commander and lieutenant colonel should select a medical, surgical, or laboratory specialty, follow its courses and serve in this specialty for three months every three years.

(3) Before being promoted to the rank of colonel, they must possess the necessary capacities for the discharge of medical direction, by having followed courses of instruction in medical organization in peace and war, epidemiology, asphyxiating gases, prevention of their effects and defensive measures, avoidable diseases, evacuation of the wounded and sick, epidemic cases and their hospitalization.

(4) With respect to the preceding points, the International Congress of Military Medicine and Pharmacy may assume the direction and control of these studies abroad.

(5) The odontologists must form an auxiliary section of the medical corps, with appropriate ranking.

(6) For complement officers of the Navy, the preference should be accorded to the civilian medical officers of the merchant marine, and these must follow, to a less wide extent, the same instruction as the officers of the active service.

Pâitre (France).

According to Medical Lieutenant Colonel R. F. Pâitre, Professor at the Val-de-Grâce, Professor of the School of Application of the Service de Santé, the three questions of recruiting, education, and advanced training of military surgeons are closely interrelated. The link between recruiting and future prospects is so evident as hardly to call for discussion. The adjective "military", added to the word "surgeon", involves an addition of qualities, not a subtraction. The two terms and the two qualities must not oppose, interfere with, or exclude each other. The first recommendation of the military surgeon to the military authority, as well as to the civilian medium, lies in his technical value. In order to be beyond dispute, this value must be comparable to that of the best medical practitioners, hence prepared and sanctioned by university teachers. In order to be usefully applied in the military medium, it must be completed by military specialization. The second part of the education of the military surgeon, begun in the School of Instruction, can be completed and terminated only in the School of Application. It is not always conducted in the same sense. As shown in some of the official reports, the program of the Val-de-Grâce still calls for the improvement of clinical education and a large part is reserved for

theoretical instruction. There exists in the United States, in Carlisle, Pennsylvania, a school which is conducted on an entirely different plan from that of Val-de-Grâce. It is a school of sanitary tactics, a center of maneuvers for the various sanitary procedures; a school of functional realization.

The common basis of medical and medico-military knowledge having been acquired, the advanced training of medical officers follows, and related to it is the question of specialization. Competition is here to be regarded, not as an end, but as a means. Summarizing, the author believes that, at the basis of recruiting, education, advanced training, and specialization of the military surgeon, there must be an honest, stimulating, and fertile selection by competitive tests.

Reynolds (United States of America).

According to Colonel C. R. Reynolds, Medical Corps, United States Army, a definite system has been developed for the training of officers of the American military medical services. This plan of training is predicated upon the fundamental principle that there is a difference between the practice of medicine in civil life and under military environment. The medical department officers are recruited from civilian medical schools and their training is almost entirely professional. Something more in their training is necessary adequately to assure that the benefits of modern medicine and surgery will be brought to the sick and wounded in war.

The importance of neuropsychiatry in the military service is apparent when we realize that nearly one half of the hospital and institutional beds are now occupied by nervous and mental patients. A knowledge of tropical diseases is essential, for the Regular Army is distributed in the Philippine Islands, Hawaii, Puerto Rico, and Panama.

To supplement the training of recently appointed medical officers, the course at the Army Medical School in Washington covers the foregoing subjects and, in general, tends to perfect the students in the professional and technical field. The course is of five months' duration. Immediately follows a 4-month course of instruction at the Medical Field Service School at Carlisle Barracks, Pennsylvania, an institution established in 1920 to provide training in medical department administration and in sanitary tactics, for officers of the Regular Army, National Guard, and Reserves.

The training of Navy medical officers parallels, in a general way, that of the Army officers, except that their administrative training is obtained largely on sea duty.

There is no corps of pharmacists in the United States Army. Officers of these qualifications are in the commissioned lists of the medical administrative corps.

Kadri (Turkey).

Colonel H. Kadri Bey, Subdirector and Professor of the Application Hospital "Gülhané", Turkey, divided the subject under discussion into three headings:

(1) Recruiting of military surgeons and pharmacists;
(2) Conditions of advanced training and professional selection of the military surgeons; the military pharmacists;
(3) The position of military surgeons and pharmacists.

The medical officers and military pharmacists have the same rights and privileges as the other officers of the active army and draw the same pay as all other officers of corresponding grade. Medical officers are authorized to practice their profession among the civil population, provided this does not interfere with their military service. They are not permitted to utilize military hospitals or institutes for their private clientele.

A Military Medical School has been in existence since 1826, in Istanbul, for the education of medical officers and pharmacists of the Turkish Army, and this school is now established in the building of the medical faculty. The accepted candidates pursue their medical and pharmaceutic studies in the University of Istanbul, where they obtain their diplomas. All their expenses are covered by the Military Medical School. At their entrance into the school, they undergo a medical examination with respect to physical and psychic fitness for military service. Here the pupils receive military instruction corresponding to that of other officers' schools, comprising the following subjects: Foreign languages (French and German); military data; military exercises; sports; civilian, military, and sanitary regulations; horseback riding; and shooting.

The courses at the medical faculty formerly lasted five years, but recently, another year has been added, making altogether six school years. The pupils who obtain diplomas from the university are given the rank of sublieutenant. These young graduated medical officers are then obliged to spend a year in the Hospital-Military

Application School " Gülhané ", in order to complete their knowledge of general, as well as military medicine. At the end of this year, they must pass an examination in the following subjects: General surgery and orthopedics, war surgery, internal medicine, psychiatry and neurology, oto-rhino-laryngo-pharyngology, ophthalmology, dermatology, and venereal diseases, urology, epidemiology, gynecology, bacteriology, radiology, pathological anatomy, biological chemistry, military hygiene, sanitation service during peace and war time. These examinations are followed by a military maneuver from the technical and medical viewpoint in war time. After passing these various examinations, the young medical officers possess the right to the rank of lieutenant, and enter the Army, to render their services as medical officers in the various military corps.

Bellet and Saint-Sernin (France).

The medical corps of the Navy, as outlined by Médecin-Chef 1ère Classe, Colonel E. J. E. M. Bellet and Pharmacien-Chimiste-en-Chef 1ère Classe, Colonel A. Saint-Sernin, in their communication on the *Recruiting, Education, and Advanced Training of Surgeons and Pharmacist-Chemists of the Navy*, is composed of surgeons and pharmacists-chemists with the mission of assuring medical and pharmaceutic-chemical service in the hospitals on board twelve war-ships, in the arsenals, and in other services and establishments of the Navy, in France and in her Colonies. The medical corps of the Navy is, likewise, charged with the instruction given in the schools of naval medicine.

The recruiting of the surgeons and pharmacist-chemists is managed entirely by the Principal School of Medical Service of the Navy, under the Faculty of Medicine and Pharmacy of Bordeaux. This school contributes, at the same time, to the recruiting and instruction of the surgeons and pharmacists of the Colonial Troops. The pupils are selected by means of competition and are distributed in divisions, according to the school year. The length of their stay in this school is equivalent to the number of years of study in medicine or pharmacy they still have to accomplish. On leaving the school, these students, provided either with the diploma of doctor of medicine or of university-pharmacist, and with two certificates of advanced studies, are placed in the medical corps of the Navy, or in that of the Colonial Troops, either optionally or officially. At this time, they are appointed either as third-class surgeons or phamacist-chemists of the Navy, or as surgeons or pharmacists, sublieutenants of the Colonial Troops. They are promoted on December 31 of the same year to

second-class surgeons or pharmacist-chemists of the Navy, or to lieutenants of the Colonial Troops. The purpose of this procedure is to give these officers a fair compensation for the long duration of their studies as compared to that of other military schools.

The surgeons and pharmacists, leaving the Bordeaux School and destined for the medical corps of the Colonial Troops, are sent to the School of Application of the Colonial Troops in Marseilles. The surgeons and pharmacist-chemists destined for the Navy follow the courses of instruction at the School of Application of the Navy, in Toulon. The School of Application of the Medical Service of the Navy has, as its objective, the insuring to the second-class surgeons and pharmacist-chemists, after their discharge from the Bordeaux School, the practical, professional education required for the special obligations incumbent on the medical corps of the Navy.

The surgeons and pharmacist-chemists of the Navy are officers, and enjoy the same privileges and have the same duties as the officers of the other navigating corps. They have not the right to civilian practice.

The officers of the medical corps of the Navy may continue instruction in their specialty, by leave of absence, in the Pasteur Institute and university clinics and laboratories. There is a special school or course of advanced training for medical officers destined for other duties than those of hospital or administrative service.

The measures taken by the Navy to recruit a teaching corps in the various naval schools of medicine and pharmacy, and a personnel specially attached to the hospital services, by competition among medical officers and pharmacist-chemists, have resulted in the maintenance in the medical corps, of a spirit of emulation and in improved instruction.

The advancement of officers of the Navy Medical Service is subject to the ordinary rules of promotion in the navigating corps. The purpose of selective promotion is to further the career of medical officers or pharmacist-chemists who have more particularly distinguished themselves by their professional aptitude, and by the services rendered in the different positions which they have occupied.

Butoïanu (Rumania).

Medical Inspector General of the Service de Santé of the Rumanian Army, Professor Dr. M. Butoïanu, stated that in Rumania the recruiting and training of medical officers is carried out in the following manner: The future active medical officers are recruited among the students of the faculties of medicine, veterinary medicine, and

pharmacy, and are admitted by competition to the Military Medical Institute of Bucharest, founded in 1888. Like the civilian students, they follow the faculty courses. After obtaining their academic degree, they enter the Medical Application School for nine months. Here they take special and military courses, such as medical tactics, administration, correspondence, and visit the clinics. At the termination of the medical or pharmaceutical course the surgeon or pharmacist is given the rank of lieutenant. Promotion up to the grade of major takes place by seniority. In order to be promoted to the rank of major, an examination is obligatory. The grades of medical and pharmacist lieutenant colonel and of medical colonel are conferred by selection. Other examinations are required for rank of medical general or inspector general, and promotion takes place by selection.

Every year medical application courses are held in the Medical Services of the Army Corps or in the Center of Military Medical Instruction. For specialization, the military surgeons—

(1) Follow the clinics and do practical work in surgery, medicine, and laboratory, in the Central Military Hospital of Bucharest or in the clinics and laboratories of the faculty;

(2) Are sent abroad for one or two years after a competitive test.

The Reserve medical officers serve for a year in the regiments. Every three years, they are obliged to participate in the maneuvers, courses, and medico-military training of the Medical Services of the Army Corps. Although there is no bifurcation in Rumania, excellent military medical specialists and pharmacists are available, who are professors, lecturers, or adjuncts in the medical and pharmaceutical faculties.

Military surgeons have the right to civilian practice, and there are military medical officers who are physicians and surgeons to civilian hospitals.

The Medical Service in regiments and in military hospitals is maintained by military surgeons and pharmacists of the active Army. The position of medical officers is the same as that of all other officers of the Royal Rumanian Army.

Blasco Salas (Spain).

Medical Captain Enrique Blasco Salas, of the Spanish Army, in his comments on the *Recruiting, Education, and Advanced Training*

of Medical Military Officers: Military Aspect, summarized as follows: Military surgeons and pharmacists are recruited among those licentiates and doctors in medicine and pharmacy who voluntarily take the annual examination. Their admission is based on their physical fitness according to the rules of the Army, judging eventual infirmities with a maximum of leniency. During their stay in the Military Medical Academy, they are considered in all respects as "military", from the insurance viewpoint. Throughout his military life, the surgeon or pharmacist has the right to be admitted to the two sections of the corps of military invalids (war invalids and service invalids). Medical officers serve during their entire career, indiscriminately in active or technical appointments, in the Spanish Peninsula, the Canary Islands, Baleares, and Morocco. They possess all the rights and obligations of the other officers of the Army (decorations, rewards, prizes, licenses). The highest rank to be achieved is that of division general for the military surgeons and of brigadier general for the pharmacists. Medical officers may freely exercise their profession in civilian practice, but this is prohibited for pharmacists.

Vollenweider (Switzerland).

Lieutenant-Colonel-Médecin P. Vollenweider, of the Swiss Army, called attention to the methods of advanced training of the officers of the Medical Service, in the Militia Army of Switzerland, a country where military service is obligatory. The Swiss Application Schools are called Officers' Schools of the Medical Service. The course in these schools lasts seven weeks; the pupils are newly graduated physicians, pharmacists, and dentists, who are subofficers of the Medical Service, having served about four months in the Recruits' School, Subofficers' School, and Repetition Courses. At the termination of instruction at the Officers' School, the young surgeon, pharmacist, or dentist is promoted to the rank of sublieutenant in the Medical Service.

It is hardly necessary to state that in the short available time, the instruction can not include long theories; it must be limited to the special medico-military branches which have no place in the curriculum of the medical faculties, namely, the purely military branches and the Medical Service in the field.

In order to be promoted to the grade of major, the medical officer must attend a central school, which affords him the opportunity of becoming acquainted with the employment of different weapons and

of maintaining the necessary contact with the fighting units. Aside from the various special courses, the officers of the Swiss Medical Service are, of course, subject to all the duties of the troops in which they are incorporated. Instruction in special courses is generally given by the corps of instructors of the Medical Service, under the high command of the chief army surgeon.

The Army instructors of the Medical Service are charged with the examinations on mobilization; the conduct and instruction of the troops in peace time as well as in war; briefly, they are actively responsible for the troops. Thus, the Medical Service in the Swiss Army is under the charge of medical officers, all of whom are officers of the militia, from lieutenant up to medical division colonel.

A great advantage of the Swiss system consists in the fact that, since medical officers, as a whole, exert their profession in military courses of extremely short duration, the work can be restricted to the purely military and medico-military instruction. This instruction is not given by means of lectures or purely theoretical lessons but is based on surmises illustrated by different situations which may be encountered in the field. These situations are rendered more or less complicated, according to the degree of instruction acquired by the pupils and the ability which they attain. Thus, in proportion as he advances in grade, the pupil finds himself confronted with tasks which demand more knowledge and ability on his part. He is, above all, expected to have a clear insight and a logical reasoning power. An endeavor is made to render the instruction as vital and alive as possible and, therefore, stimulating to the students.

Thureus (Sweden).

Dental and Surgical Instruction and Instruction in Maxillo-facial Prostheses, given to the Swedish Military Surgeons and Dentists, was described by Dr. S. Thureus, Chief of the Section of Stomatology and Otology of the Military Hospital of Stockholm. As the military authorities in Sweden and the Medical Board of the Army Administration duly appreciate the importance, for the Army, of rational care of the teeth and mouth, as well as the treatment by maxillo-facial prostheses of jaw injuries, further improvement is being aimed at in this branch of the medical sciences. While the members of the Medical Service in the Swedish Army have a definite status and organization, the military dentists enjoy no advantage of this kind. This is regrettable, and it is desirable that there be a firmly established organization for the treatment of the mouth and

teeth. The tuition and training of dentists liable to service and duly appointed military dentists are assured by special courses in dentistry and care of the mouth, as well as in the adjustment of maxillo-facial prostheses following jaw injuries. These courses are of a kind to ensure to the Swedish Army the most appropriate care in peace time and in war. In the last years, similar courses have been instituted, with beneficial results, for Medical Service recruits and for younger and older officers of the Military Medical Service.

PSYCHONEUROSES OF WAR: THE IMMEDIATE AND REMOTE EFFECTS OF WAR ON THE NERVOUS SYSTEM OF COMBATANTS AND NONCOMBATANTS

OFFICIAL REPORTS

Fribourg-Blanc (France).

In his official report on *War Psychoneuroses: Immediate and Remote Effects of War on the Nervous System of the Combatants*, Medical Commandant A. J. Fribourg-Blanc, Assistant Professor at the Val-de-Grâce, Professor of the School of Application of the Service de Santé, stated that the study of this subject is fully justified by the facts as noted in the World War. He divided the vast material into four parts:

I. The etiology of war psychoneuroses.
II. The principal clinical forms observed, and their remote results.
III. The medico-legal consequences of war psychopathies.
IV. The treatment of war psychoneuroses.

I. *Etiology of war psychoneuroses.*—It is rare not to discover in the genesis of all psychopathic conditions an association of predisposing and of determining factors. Psychiatry can not escape this rule of general pathology. Only a respective part of the two factors varies according to the case.

A. Predisposing factors: In war psychiatry, the favoring causes of mental disturbances are exactly the same as those encountered in peace-time practice. They may be either hereditary or personal and acquired. In the course of the last twenty years, constitutional psychopathic tendencies have been the object of numerous highly interesting studies. Undoubtedly, in the etiology of psychopathies supervening in the course of war, it is necessary to take into account the constitutional tendencies, like the other predisposing factors, which are the soil on which the mental disease originates and develops.

B. Determining factors consist primarily of traumatism, which is found at the basis of certain post-concussional states and certain acute confusional syndromes. The direct rôle of the traumatism in these psychopathic manifestations has been proved by numerous observations in the war. Frequently repeated emotions, by their intensity or by the repetition itself, finally upset the psychic equilibrium of the soldier, up to the manifestation of a (sometimes) serious pathological state. The war proved to all who shared the rough existence at the front that the frequent repetition of emotional shocks does not immunize the soldier against future emotions. On the contrary, it sensitizes his nervous system and gives rise to the fear of a new shock. The fact that the three classes of determining factors essentially inherent to army life in war time, i. e., traumatism, emotion, moral shock, have, in a large number of cases, given rise to mental disturbances, would suffice to demonstrate the (at least) partial responsibility of the war in the development of the psychoses. But aside from these factors closely dependent upon the hostilities, there are many others which, although of more ordinary type, were, nevertheless, connected with the state of war: prolonged physical fatigue, overexertion, physiological distress caused by sleepless nights, long marches, stagnation in the mud of the trenches, sustained efforts at the time of attacks or the organization of a sector of the front, activities participated in by soldiers as well as by stretcher bearers in the transportation and evacuation service. As a sequel of this physical fatigue, sometimes reacting on all the functions of the organism, states of profound psychic depression up to genuine "exhaustion psychosis", have been known to supervene.

Ordinary infectious diseases and epidemic diseases occur more frequently during war than in peace. Cases of acute psychosis of confusional type have appeared in connection with influenza, typhoid fever, and tetanus. Toxemias of endogenic origin, through gastro-intestinal disturbances, and hepatic or renal insufficiency, with azotemia or chloruremia, are known to favor the onset of psychic disturbances of a general depressive type. Toxemias of exogenic origin, undoubtedly favored by war (alcoholism, drug addiction, toxicomania), contribute even more considerably to the etiology of the psychopathies. The constitutional predisposition represents the soil, and the determining or occasional factors furnish the germ of all mental affections. The

war multiplies these determining factors in intensity and in frequency and, from this viewpoint, is responsible for the increase of the psychopathies.

II. *The principal clinical forms observed, and their remote results.*—There exists no absolute boundary between neuroses and psychoses. The disturbances of the mental equilibrium comprise infinite varieties, and the transition from neurosis to psychosis may take place by imperceptible degrees. However, this classical distinction between the two great psychopathic groups remains necessary for the clarity of description and the classification of data.

A. Neuroses: In the group of neuroses, the following effects were observed during the war, and are still noted at the present time in war veterans, in the form of sequelae:

(1) The post-concussional syndrome; this supervened in generally normal soldiers, as the result of explosion of a shell at a short distance.

(2) The post-emotional syndrome, which is not like the foregoing, based on a neurological substratum; although apparently less grave than the former, it is, nevertheless, generally more persistent and intractable. It may persist in an obstinate, rebellious fashion for a very long time after the war.

(3) Epilepsy, which may have a war origin, either as traumatic epilepsy through direct injury of the encephalon (trephining through projectiles, or surgical operations; presence of intracerebral foreign bodies) or as post-concussional epilepsy (result of explosion of large shells or of mines); toxic or infectious epilepsy (result of meningo-encephalitis, sequel of vaccination or serotherapy); finally, so-called essential epilepsy present prior to the war but aggravated through the circumstances of military life. Epilepsy, in all its forms, may be represented by convulsive seizures, either localized (Jacksonian epilepsy, especially frequent in cases with traumatic lesions) or generalized, and by so-called equivalents: absent-mindedness; vertigos. It may be complicated by mental disturbances, developing slowly towards epileptic dementia, passing through all the degrees of a state of general deficiency of the psychic faculties, with diminution of attention, memory, and association of ideas. It is noteworthy that epilepsy may appear in old cases of craniocerebral traumatism a long time after the

injury. The author has reported several cases of this kind, supervening nine or even twelve years after the war, in men with cranial injuries, with a latent cerebral abscess or a secondary infected cyst of the brain, as well as in other cases having unrecognized intracerebral projectiles, finally revealed by radiography. The importance of epilepsy in war must, therefore, be emphasized because of its consequences during hostilities as well as of its always serious delayed sequelae.

(4) Neurasthenia: The majority of psychiatrists now reserve this term for transitory depressive states connected with a deficiency of the organic functions. This syndrome is generally induced by prolonged physical and psychical strain and overexertion; it is characterized by combined signs of nervous exhaustion, in the form of general physical and intellectual asthenia, nervous dyspepsia, disturbances of the neurovegetative equilibrium, a state of psychic depression with nosophobic preoccupations, egocentrism, dysmnesia, aprosexia. On the removal of the determining causes of the neurasthenia, the pathologic syndrome usually disappears; but notable sequelae may persist, to the detriment of the individual.

(5) Obsessional states and phobias, anxiety neurosis, belong to the same group of neuropathic symptoms, appearing on a soil of pathological emotivity. This emotional soil may be of congenital character or it may gradually become established in the psychism of the individual through the repeated action of factors which disorganize his nervous equilibrium. The emotional constitution, often associated with disturbances of effectivity and volition, serves as the substratum of various psychoneuropathic manifestations, such as obsessions, phobias, anxiety, impulsiveness. The emotional constitution accordingly includes emotional factors: hypermotivity, hypersensitivity, weakening of the will; and organic factors: a tendency to spasms, tremors, vasomotor disturbances, corresponding to a persistent neurovegetative loss of equilibrium. These emotional and organic factors combine their effects and determine the multiple reactions of the patients. The emotional constitution is very common, and these states have been made the object of very numerous studies during and since the World War.

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(6) Hysterical states supervene on a special psychic basis, eventually characterized by a pathological mental suggestibility and a tendency to mythomania or fabulation. The war gave rise to very numerous hysterical manifestations of neurological type, as well as in the form of mental syndromes. The most common neurological manifestations were: convulsive phenomena, pseudoparalysis, contractures, various functional disturbances of standing and walking (astasia-abasia), of speech (mutism, stammering), of sight (amblyopia, amaurosis), of sensibility (anesthesia). The most frequently encountered mental forms of hysteria were: pseudostupor with stupidity, pseudocatatonia, pseudomental confusion, pseudomanias and melancholias, pseudodelirium, pseudoretrogression of the personality (mental puerilism). An intermingling of these various clinical types or a succession of these different manifestations have often been observed in the same individual.

The essential differential diagnostic feature of the pseudopsychoses from the genuine corresponding states is their curability by simple suggestion. But it must not be overlooked that hysterical manifestations are often associated with organic nervous lesions or with true psychic disturbances. On the other hand, hysteria must not be considered as a simple superficial manifestation devoid of a bearing on the patient's future, or as a purely utilitarian pathomimicry. Hysteria is entitled to more profound attention, as an affection appearing only on a very peculiar mental soil. It would be a mistake to liken hysteria to simulation, and although it is true that a utilitarian purpose occasionally enters into the hysterical manifestation, it is no less a fact that disturbances of this kind do not occur indiscriminately in all persons. A prepared soil is needed for the onset of hysteria. The necessary distinction between hysteria and simulation was clearly pointed out by Porot in his report at the 25th session of the Congress of Alienists and Neurologists.

The pathological nature of hysteria is now well grounded on facts. Utilitarian tendencies are far from being the rule in the outbreak of hysterical disturbances, which are often opposed to the best interests of the patients. According to the definition of Hesnard, adopted by the author, hysteria is a neurosis in which the patient, predisposed by a peculiar plasticity of his nervous system, tends to express unconsciously an

auto- or hetero-suggestion in corporeal form (mimicry, speech, movements, sensory perception), varying greatly according to his environment and his beliefs.

The rôle of environment, as stated in this definition, possesses an importance of first rank in the appearance of hysterical manifestations. This was rendered strikingly evident by the events of the war. In the military medium, at all times, are encountered the two factors most favorable for the onset of hysteria: suggestion and contagion, which correspond to the two fundamental tendencies of hysteria—suggestibility and special aptitude for imitation. During war, a new condition intervenes, in addition to these two favoring elements, in the form of the emotional factor. Emotion alone is known to be incapable of determining hysterical manifestations, but, by shaking the nervous equilibrium, it is capable of exalting the suggestibility and of eliciting hysterical phenomena after a certain period of latency. Illustrative examples are innumerable. In all the medical units of the armies and the interior, more particularly in the neuropsychiatric centers, an abundance of patients were seen during the war suffering from hysterical disturbances in the most variegated forms and in a proportion distinctly superior to that of peace time. Genuine epidemics of hysterical manifestation occurred locally, illustrating the part played by contagion in this respect, such contagion being especially common in the natives of northern Africa, whose infantile mentality was revealed on this occasion. The observation of these patients has given rise to numerous interesting contributions on deaf-mutism, the aphonias, stammering, contractures, convulsive seizures, and mental disturbances in hysteria. Very instructive specimens of contractures and contortions, constructed from living models, studied in the psychiatric center, are preserved in the Museum of the Val-de-Grâce.

As to the subsequent fate of all these war casualties, they recovered as a rule, either spontaneously or, especially, by virtue of a rapid and energetic reeducation. The determining factors—suggestion, contagion, and emotion—having disappeared, their disturbances did not recur. But there are numerous exceptions to this general rule. Hysterical syndromes, referable to the World War, are still observed, and have persisted through crystallization of the functional disturbance and, sometimes, have actually become aggravated. The prognosis as to the fate of hysterics must be extremely guarded. Due precisely to the

fragility of his mental fundus, such a patient remains vulnerable, susceptible to other disturbances. Certain individuals have been encountered by the author, who, after recovering from paraplegia or aphonia, returned a few months later suffering from hemiplegia or deafness.

B. Psychoses: In the group of psychoses, all the known forms of mental disturbance are observed among mobilized soldiers. A division is made by the author between:

(1) Mental infirmities, simple or complicated.
(2) Loss of mental equilibrium.
(3) Periodic psychoses.
(4) Systematized psychoses.
(5) Confusional states. These conditions occupy a very important part in war psychiatry. Their origin is very variable and their clinical varieties are no less so. They can be classified simply in two groups: confusional states of traumatic origin and confusional states of nontraumatic origin.
(6) Dementia præcox. The majority of men with war dementia præcox are now found in asylums.
(7) Organic dementias. These psychopathies are far from presenting the interest of the preceding affection in war psychiatry. The few patients of this group who were hospitalized during the war in the Val-de-Grâce, were all syphilitics or abusers of alcohol; they ranged in age from 40 to 49 years.
(8) General paralysis, the syphilitic etiology of which is now well established, would likewise be favored by injuries of the brain or grave cranial traumatism. It been demonstrated that the war was responsible in some positive cases of this kind. In others, the condition was due to the fact that certain syphilitics had abandoned all treatment, in consequence of hostilities.
(9) The toxicomanias and, more particularly, alcoholism, in all their forms, acute and chronic, occupied a large place in the mental pathology of the war. In spite of the exonerating circumstances of war, the responsibility of the State must be accepted with respect to the results of the exposure.
(10) Simulation of mental diseases was less common in war time than might have been surmised. Of all diseases, insanity is the most difficult to imitate, no matter what the

laity may imagine; and its simulation does not withstand the close observation of a forewarned psychiatrist. Observations collected in the Central Service of Psychiatry of the Val-de-Grâce indicate that the ingenuity of malingerers, with respect to mental diseases, did not reveal itself as very active during the World War.

III. *The medico-legal consequences of war psychopathies.*—The medico-legal consequences of war psychoneuroses are to be envisaged from a twofold viewpoint:

A. That of the responsibility of the State with respect to the invalidism resulting for the patient from his affection, demonstrated during the war.

B. That of the penal responsibility of these patients in cases of delinquencies.

For practical purposes, the question of the medico-legal consequences of war psychoneuroses resolves itself to a problem of diagnosis. The diagnosis having been rendered, the therapeutic and medico-legal solutions impose themselves automatically. This conclusion involves the necessity of developing in peace time psychiatric instruction of the medical officers of the Army and of the Reserve, and of directing their attention to the psychoneuropathic war manifestations, as to all the atypical forms of insufficiently known psychopathies. This conclusion, furthermore, brings out the necessity of developing in war time the useful collaboration between the high command, the military judges, and the medical officers, for the purpose of guarding, in the greatest possible measure, against always regrettable miscarriages of justice.

IV. *The treatment of war psychoneuroses.*—The therapy of the neuroses and psychoses observed during war is identical with that of the same affections encountered in peace time. This treatment consists of the customary medicinal, physiotherapeutic, and psychotherapeutic measures. The same rules apply to the management of old war psychopaths, now entrusted to our care. Remarkably good work has been done and excellent results have been achieved in the treatment of hysterical disturbances, such as paralyses, aphonia, stammering, psychopathic states.

From the therapeutic viewpoint, the great special problem of war psychoneuroses is that of the organization of treatment centers. Their organization must be foreseen in peace time, in order to guard against the inconveniences of a superficial and hasty improvisation elaborated under the pressure of events. Hospitalization of psycho-

paths must be provided in the armies and in the interior. The organization of the regional centers must be carefully studied during peace. Their medical personnel must be numerous, and specialized in neurology as well as in psychiatry. It is of advantage to collect in the same center the neurological affections and the mental diseases. Patients with cranial injuries may also suffer from organic lesions of the nervous system and psychiatric disturbances. Hysterical patients may, simultaneously or successively, present manifestations of neurological type or in a mental form.

The Psychiatric Center of the Val-de-Grâce hospitalized over 20,000 patients from August 2, 1914, to November 11, 1918. Aside from the care of the inmates, this center furnished an important consultation and expert service. Thus, during the year 1917, 6,187 patients passed through the Val-de-Grâce Center, including 4,070 hospital examinations, 1,909 consultations, and 208 medico-legal cases.

A neuropsychiatric center must, accordingly, serve as a place for examination, diagnosis, treatment, and distribution to other centers, as indicated. This service would be very rapidly blocked and encumbered and its functional activity paralyzed, if all the minor psychopaths were kept here until their complete cure.

While the organization of the psychiatric service must not be left to improvisation at the last moment, there is another question which must be considered, namely, that of the selection of recruits from the viewpoint of their psychic fitness. This is an important and debatable problem in which two great principles conflict with each other: that of preservation of the fighting force and that of mental prophylaxis in the army. All those physicians who have taken up this question are of the opinion that, in peace time, the utilization of certain psychopaths should be foreseen in case of war, and decision made as to the occupations which it would be possible and safe to entrust to them.

Conclusions

(1) War, especially when of long duration, undoubtedly plays a part in the genesis and incidence of mental disturbances observed in the course of hostilities. Psychopathic heredity, degenerative states, and pathological constitutional tendencies do not cover every phase in the etiology of mental disturbances. The occasional or determining factors are of considerable importance, and in war time these factors are numerous and their rôle is considerable: wounds, concussions, physical fatigue, physiological want, various intoxications (alcoholism), moral shocks, emotions. The rôle played by emotional shock is of particular importance in the genesis of psychoneuroses,

hence the frequency during the war of post-emotional syndromes and hysterical states.

(2) However, war has not created psychoses of a new kind, of a hitherto unknown symptomatology or evolution. No new morbid entity has been observed; only the relative frequency of certain psychoses has been modified (frequency of confusional states on the basis of emotionalism—"shell shock").

(3) The symptomatology of every war psychosis was, on the whole, entirely comparable to that observed in the same patients in peace time, but this symptomatology became colored by the events of war, of which it was a faithful reflection.

(4) The anti-social reactions provoked by the psychoneuroses of war were, likewise, of the same character as those of peace time, but they assumed a special complexion due to the circumstances of war, and had more serious consequences than in peace time for the patients themselves, as well as for those in their environment and for army discipline.

(5) The responsibility for psychoneurotics produced by the war has been accepted by the State as regards the granting of disability pensions, under the law of March 31, 1919. In case of delinquency among patients suffering from psychoneuropathic disturbances, the medical specialist called on to give his opinion on the penal responsibility of the patient can formulate decisive conclusions only after a profound study of each individual case.

(6) Provision should be made in peace time, for the organization of the neuropsychiatric service in the field. This service should comprise:

A. A neuropsychiatric center per army, installed at the main clearing-station, essentially destined for the sorting of patients suffering from neurological or psychopathic disturbances, with evacuation of serious cases to the rear, and for the treatment of all patients presenting disturbances amenable to a cure within a short time.

B. Special means of evacuation for personnel and matériel, to be placed, in case of necessity, at the disposal of the regular evacuation trains.

C. A regional neuropathic center, in every region of the interior, installed in the principal hospital of the capital, liberally supplied with specialized personnel and charged with:

(*a*) A second sorting of the patients;

(*b*) Their distribution in three groups: major psychopaths, requiring asylum treatment; patients suffering from

transitory and benign acute disturbances (these to be treated in the regional center itself); patients presenting curable psychoses, but requiring a more prolonged treatment. For the latter category, the organization of secondary regional centers should be provided, destined especially for the treatment of curable psychoneuroses (minor mental cases).

There is reason, finally, to provide in peace time for the selection of recruits with psychic infirmities and for their special employment in war in tasks where they may be capable of doing useful work. This solution is indispensable for the utilization of these "brain cripples", and for the application of the elementary rules of mental prophylaxis.

NOTE.—The United States of America divided the second question into four parts for consideration by experts in each.

Lorenz (United States of America).

W. F. Lorenz, Professor of Neuropsychiatry, University of Wisconsin, Colonel, Medical Corps, United States Army Reserve, in the first section of the American official report, *Neuropsychiatry in Military Medicine*, stated that during the World War, military ineffectiveness, because of mental and nervous disability, became a serious problem for the medical department. Experience has taught that the possibility of using mentally deficient adults, in even a limited capacity, in military organizations must be abandoned. With respect to the psychoses, which present a somewhat simpler problem, the author pointed out that the present annual cost of veterans' relief in the United States is over five hundred million dollars per year. Nearly 50 per cent of all casualties is due to psychoneurotic disabilities that are connected or related, by legislation, if not in fact, to military service. From a personal experience with an active division, the author is of the impression that less than 15 per cent of those labeled as "shell shock"—a deleterious and misleading term—were ever evacuated beyond the divisional zone. Those that were returned to the United States represented only a small portion of the number evacuated from the front lines.

It might be well, and would certainly better meet the neuropsychiatric problems, if there were a period of three months of probation before an individual were finally accepted or inducted into military service. There were 66,759 neuropsychiatric cases recognized and revealed by special examining-boards in the World War. These cases had been passed by the local draft boards and were found in

the home forces. Of this number, 52.6 per cent were rejected after one month of military service, 22.1 per cent after two months of service, 12 per cent after three months of service. Upon this experience, one would conclude that over 85 per cent of the serious neuropsychiatric cases totally disqualified for military service could be recognized and eliminated within this suggested probationary period.

Throughout the period of training, psychiatry should be well represented in the medical personnel at the camps and with the larger organized units. The assignment of one psychiatrist to a regimental staff would be apparently adequate for the neuropsychiatric cases likely to develop within this number of individuals.

In the light of past experience, more attention must be given to the state of mind of the apparently normal soldier. All psychoneuroses do not develop upon the basis of an abnormal constitution. The factor in the production of psychoneuroses is constitutional defect and a conflict between the instinct of self-preservation and the social standards of one's compatriots.

The plan of instruction against gas warfare should be modified, in order to guard against so-called "gas hysteria", stressing the protection given by gas masks rather than overemphasizing the lethal properties of the gas.

Therapy and prophylaxis are based on recognition by general medicine of the importance of neuropsychiatry, as a vital agency in the event of war. Adequate examining-boards must be installed, equipped with competent psychiatrists, during war; and their formation is needed during peace time. It was found that 85 per cent of grave neuropsychiatric cases were disqualified for actual service after three months in the army. The need is emphasized for the training of line officers to recognize and accept the importance of this group of patients; the assignment of competent neuropsychiatrists to every military unit of any size; the grouping of soldiers from their home localities, rather than widely scattering them, tending towards the development of the herd instinct and overbalancing the effect of concentrated casualties on the civilian population.

The use of attractive uniforms with all their emoluments, music, and all the trappings that go into a martial setting, have a beneficial effect upon the morale of military personnel. The drab, ill-fitting, unattractive uniform may be highly effective to hide from the enemy, but it falls far short of building up any *esprit de corps*. Even though the bright colors might make troops more visible, such a tactical disadvantage would be more than offset by the soldier's better frame of mind. One would therefore advocate as good mental hygiene in

military medicine, that at least divisions, or better regiments, be distinctly and brightly uniformed, thus promoting the herd instinct and serving to prevent the psychoneuroses of war.

Summary of Conclusions

(1) Comparison of advance in neuropsychiatry with sanitation and hygiene in reference to development and support by medical profession and civilian population.

(2) Discussion of psychoses—psychoneuroses and mental deficiency—with disposition of each group by the military organizations, stressing especially the prompt recognition and early separation from the military service of the above groups.

(3) The deleterious effect of the term "shell shock", offering the psychoneurotic an outlet or avenue of escape from his insurmountable situation, and deploring the use of the term.

(4) The effect of actual warfare on dementia præcox, manic-depressive and general paralysis, including cerebrospinal syphilis. The agencies in war are in no wise different from those met in every-day civilian life.

(5) Necessary time consumed by other personnel in caring for this group of patients as an argument for their early separation.

(6) The total number of neuropsychiatric cases amounts to nearly 50 per cent of all casualties, the present cost to the Government amounting to over five hundred million dollars.

(7) The factor in the production of psychoneuroses is constitutional defect and a battle between the self-preservative instinct and the social standards of one's fellow countrymen.

(8) Discouraging the method of instruction against gas warfare (gas hysteria), stressing the salubrious advantages of the training rather than the disastrous effects of the various gases.

(9) The author makes a prophecy that the number of neuropsychiatric cases will be far more increased in any future war on account of these psychic reactions.

(10) Treatment: Recognition by general internal medicine of the importance of neuropsychiatry as an important agency in the event of a war.

(11) Adequate examining-boards, manned with competent psychiatrists, in the event of war, and their formation during peace time throughout their respective countries.

(12) Constant observation of those accepted, for a period of three months, to eliminate immediately the above group of neuropsychiatric cases.

(13) Eighty-five per cent of serious neuropsychiatric cases were disqualified for actual service after three months' service.

(14) The training of line officers to recognize and accept the importance of this group of patients.

(15) The assignment of competent neuropsychiatrists to every military unit of any size.

(16) The grouping of soldiers from their home localities, rather than widely disseminating them, would tend toward the development of the gregarious instinct and would overbalance the effect of concentrated casualties on the civilian population.

(17) The use of attractive uniforms with all their emoluments has a beneficial effect upon the morale of military personnel.

Matz (United States of America).

In the second part of the American report, *The Immediate and Remote Effects of the World War on the Nervous System*, Dr. Philip B. Matz, Medical Service, United States Veterans' Bureau, stated that the statistics of the Adjutant General's Office (Love and Davenport, *Defects Found in Drafted Men*, 1920) indicate that the various local boards throughout the country, as well as the medical boards on duty at the various camps, rejected approximately 82,392 drafted men who were said to have nervous and mental disabilities. The largest group, consisting of 39,095 men, were said to have mental deficiency. The other nervous conditions for which rejection was made, were: Epilepsy, psychoneuroses, and neurasthenia.

The summary and conclusions of this contribution are as follows:

(1) One of the lessons taught by the war was that an appreciable portion of the manhood of the country was imperfect both physically and mentally, so that during the examination of the drafted men, 16 per cent of the total number were rejected. Of those rejected, one fourth were said to have had neuropsychiatric conditions, of which mental deficiency was the most frequently found and the most common cause for disqualification.

Approximately 82,392 of the rejected drafted men were said to have had nervous or mental disabilities and, of this number, 39,095 showed the presence of mental deficiency. Some of the other neuropsychiatric conditions for which rejection was made were epilepsy, psychoneuroses, and neuroses.

(2) From 1917 to 1919 inclusive, 78,930 men and women were discharged from military service on account of some neuropsychiatric disease. This number constituted 25 per cent of the total num-

ber of men discharged from the military service for disabilities, the latter number having been 313,200.

In 1920, 4,926 ex-service men were hospitalized by the Government for some form of neuropsychiatric disease; the number has increased from year to year and on June 30, 1930, 14,941 ex-service men were under hospitalization by the Veterans' Bureau for nervous and mental disease.

The increase of neuropsychiatric disease among ex-service men from year to year shows that the incidence of this disease varies with age, and is dependent upon constitutional and certain precipitating social or economic factors not related to the military service.

(3) It is the consensus of opinion of psychiatrists that the World War has revealed no new mental traits and that the psychoses noted during the war differed only from those found in civil life in that they were colored by war experiences.

Many observers are of the opinion that states of confusion were the principal mental disorders during active warfare and that these conditions were due to emotion and nervous fatigue, in addition to a predisposing constitution. Dementia precox was a common psychosis found among the troops. Inasmuch as this psychosis is most prevalent in civil life, it is reasonable to assume that the underlying etiological factor is a constitutional predisposition of the individual. To this may be added a large number of precipitating factors of warfare, such as trauma, the breaking of home ties, social maladjustment, worry, family cares, and a dread of future disability or death.

(4) According to most observers, the psychoneuroses of war were rarely associated with external or somatic wounds. Furthermore, the psychoneuroses developed in individuals who had a susceptible neuropathic or psychopathic constitution. To this must be added the precipitating factors, such as fatigue, mental or physical, shortage of food, and other conditions encountered during the late war.

The psychoneuroses were defense reactions, the function of which was to protect the individual against experiencing the traumata of warfare. It was shown that, with cessation of active warfare, the psychoneuroses ceased to develop, indicating that self-preservation was the underlying mechanism in their development.

(5) The Veterans' Bureau statistics show that there were 9,194 patients with neuropsychiatric disease under hospitalization in 1923, and that by 1930, the number had increased to 14,941. It is believed that the reason for the increase of hospitalized veterans from year to year is due to the excess of admissions over discharges

and deaths. It is realized that the peak of the hospital load has not as yet been reached, so that the Bureau is making provisions for the construction of additional hospitals to take care of the expected increase.

(6) It is the policy of the United States Veterans' Bureau to treat ex-service men with psychoneuroses in outpatient facilities in so far as possible. However, because of the fact that these disabilities have become fixed and the patients have attained a chronic state of invalidism, it has become necessary to treat some of these beneficiaries in hospitals rather than in outpatient clinics. This accounts for the large number of hospital admissions of ex-service men with psychoneuroses during 1930.

(7) The largest number of ex-service men under hospitalization for psychoses in Veterans' Bureau and other Government hospitals, were those with dementia præcox; the next largest number were being hospitalized for general paralysis; and the third largest group were patients with manic-depressive psychosis. It is noted that while a large number of ex-service men were admitted to hospitals with psychoneuroses, nevertheless, the number remaining under hospitalization at the end of the fiscal year was comparatively small.

(8) A study of the immediate results of the hospitalization of ex-service men with neuropsychiatric disease for the fiscal year 1930 shows that of a series of 12,229 veterans discharged from the Veterans' Bureau and other Government institutions, 53.4 per cent were recovered or improved; 14.45 per cent were unimproved; 4.23 per cent had died; and in 27.92 per cent of the cases, the condition upon discharge was not indicated. The fact that more than one half of the patients discharged from Government hospitals were either recovered or improved, speaks well for the type of treatment received.

(9) A study was made for the purpose of ascertaining the remote results of the hospitalization of a group of 2,684 veterans who had been under institutional care for a period of approximately six years. This study revealed the fact that 51.2 per cent of the group were recovered or improved; 32.34 per cent were unimproved; 10.43 per cent had died; and the condition of 6.03 per cent of the group was not indicated.

(10) In a study of 246 ex-service men who were admitted to Veterans' Bureau and other Government hospitals for the treatment of general paralysis, it was found that 117 of the number were within the age group 30–34; 31 were within the age group 25–29; and 6 were within the age group 20–24.

It is believed that the inception of general paralysis, during and soon after discharge from military service, was at a much younger age than in civil life, and also that when the disease established itself, psychical and mental deterioration and death were rapid. The possible reason for this, as stated by Fraser and Duncan, is that the treatment of syphilis during military service consisted of the administration of mercurials and arsenicals, and the treatment was most intensive, with the result that damage of the central nervous system was a common occurrence. This was followed by a lowered resistance to the spirochætal invasion and an early inception of neurosyphilis, with a rapid extension of the latter disease.

(11) Pulmontary tuberculosis, cardiovascular disease, and bronchitis were found to be the most common coexisting diseases complicating the neuropsychiatric condition in the group of ex-service men studied.

(12) In reviewing the hospital records of these patients, one is impressed with the frequency of readmissions. The following are the most likely reasons for the same:

(*a*) Ease with which this type of patient may be admitted to the Veterans' Bureau hospitals.

(*b*) The tendency on the part of the Veterans' Bureau to discharge these patients so that they may adapt themselves to home life as well as to community conditions at an early date.

(*c*) In the case of claimants with nonservice-connected neuropsychiatric conditions, the Veterans' Bureau is constrained to treat such men in hospitals as they are not entitled to dispensary care.

(13) Two hundred and eighty deaths occurred among the 2,684 patients, of which number 60.71 per cent died from general paralysis, 17.14 per cent from tuberculosis, and 2.5 per cent from some form of heart disease. The remaining deaths were due to various other causes of insufficient importance to group. In the consideration of the age of death, the largest number, 97, were among Veterans' Bureau patients within the age group 30–34 years; the next largest number of deaths, 54, were within the age group 35–39 years.

(14) In the treatment of ex-service men affected with nervous and mental disease in Veterans' Bureau hospitals, the aim is to use the most modern régimes known to medicine. Another objective is to restore these patients to useful hospital and community life as rapidly as possible. Accordingly, the hospitals are manned by well-qualified professional and technical personnel and contain special

departments for the treatment of coexisting or complicating diseases. In addition, they are equipped with special physical therapy and occupational therapy departments, which are engaged in rehabilitating the ex-service men so that they will adapt themselves first to the institution and its environment, following which, to community life.

(15) In the Veterans' Bureau hospitals, special therapeutic régimes have been used successfully in the treatment of neurosyphilis, such as tryparsamide, inoculation malaria, foreign protein therapy, and diathermy. The results, thus far, with these new therapeutic régimes have been most encouraging.

(16) In the application of occupational therapy to the treatment of psychotic patients, two objectives are looked for by the United States Veterans' Bureau; these are hospital adjustment and social adjustment.

The Veterans' Bureau divides all patients from the standpoint of occupational therapy into three groups: A, B, and C. Patients classified in group C are deteriorated and are in need of training in personal hygiene and habits; they are usually patients with low mentalitity who are capable of performing only elementary tasks. Patients classified in group B are of an intermediate type. Patients in group A are those who are approaching the stage of hospital life previous to discharge. These patients have adjusted themselves and are able to carry on constructive occupations of some kind prior to being sent to their homes.

(17) In a study made of the future incidence of nervous and mental disease in the ex-service population, it was estimated that there will be approximately 41,917 veterans affected with nervous and mental disease by January 1, 1946. It indicates that, as the veterans grow older, they are more prone to nervous and mental disease.

Madigan, Odom, and Porter (United States of America).

The third portion of the American report, *The Psychoneuroses of War: The Immediate and Remote Effects of War on the Nervous System of Combatants and Noncombatants*, was taken up by Patrick Scarsfield Madigan, Major, Medical Corps, United States Army, Cleve Carrington Odom, Major, Medical Corps, United States Army, William Clare Porter, Major, Medical Corps, United States Army, Chief and Associates, Neuropsychiatric Section, Medical Service, Walter Reed General Hospital, United States Army.

The following data will give some indication of the prevalence of nervous and mental disorders during mobilization, during the com-

bat period, and subsequent to demobilization. At the time of mobilization of the man-power for the World War, 3,500,000 men were examined, and it was found that about twenty out of every thousand had some form of nervous or mental disorder, or a total of 69,334 men—more than the war strength of three infantry divisions. Had the examiners been less efficient, a great percentage of this number would have been added to those which later developed, when placed under the stress and strain of actual combat. The daily admission rate to hospitals for nervous and mental disorders per 1,000 strength of white enlisted men in the American Expeditionary Forces, combat division, on the battle line, was 0.57; combat division, not on battle line, 0.20; total, 0.39. Only three other conditions—respiratory, digestive, bones and organs of locomotion disorders—showed a higher incidence.

The number of World War veterans under hospitalization for nervous and mental disorders will increase until the maximum will be reached in 1947. On January 1, 1929, there were 18,393 veterans under hospitalization, and on the same date there were 54,785 Bureau beneficiaries receiving compensation for neuropsychiatric disease.

Summarizing their collected data on the etiology, psychopathology, symptomatology, and treatment of the psychoneuroses, the authors gave the following—

Conclusions

(1) The effects of war upon the development of the psychoneuroses differ in no way from the obstacles encountered in civilian life.

(2) The number of psychoneurotics could have been greatly lessened if there had been enough time for their classification, and for the removal of this type of personality from military service during the war.

(3) Our knowledge of the etiological factors in the course of the psychoneuroses has been greatly enhanced since the war.

(4) A distinction is made between "functional", as a synonym of dynamopathic (with physiopathic and psychopathic fractions), and "organopathic". An attempt is made to define neuropathic predisposition, "neurotic" and constitutional inferiority, as an intrinsic congenital deficiency of the inhibitory neurons of the neopallium, and intrinsic endocrinic imbalance. Superimposed upon this congenital deficiency, there is an acquired modification of the reflex activity of the viscera, resulting in an habitual state of disease.

Suggestion and introspection assist in the fixation and aggravation of these anti-social habits. An intolerable emotional tension gives rise to a conflict between the desire to flee and the fear of losing one's self-respect and the good opinion of others, or the fear of disciplinary measures.

Fatigue and deprivation are contributory factors. They manifest themselves in a removal of inhibition over the lower instinctive and physiological reflex mechanisms of self-preservation, and a group of abnormally acting visceral reflexes are released or a conversion into a disabling physical syndrome may take place. When the environment improves, the disabling symptoms disappear, unless the motive for remaining sick is stronger than the motive to recover. This motive to remain sick may be fixed through the expectation of a compensation, or of an improvement of the cause held responsible for the onset of the condition.

There is no absolute necessity for distinguishing symptomatological types in the psychoneuroses, when the constitutional psychopathic basis has been established. Each separate condition represents the individual method of a predisposed person to escape from an intolerable situation.

(5) The best preventive and prophylactic measure consists in the prompt recognition of these unfortunate personality deficiencies and their efficient management. This can be best accomplished by providing for a sufficient number of trained psychiatrists in our armies, in peace time, and a reserve quota, of equally experienced psychiatrists, ready for immediate service, in time of declared or imminent war. Even the most experienced civilian specialist can not be expected, at the outset of his military career, to be familiar with the various factors confronting the military specialist in modern warfare, unless he has had the benefit of previous military training. Those eminent psychiatrists can not be lauded too highly, who so generously bestowed their efforts and their energy during the World War and who accomplished such admirable results.

The next important point is the establishment of competent neuropsychiatric boards to examine, if possible, all recruits during, if not before, their actual enlistment. A decision can thus be reached as to their rejection, or conditional assignment to definite organizations where the service involves less danger and the emotional strain is somewhat reduced. It is manifestly impossible to have our front-line troops exclusively composed of well-balanced, stable, unemotional individuals, so we must, of necessity, be able to take care of those not so constructed.

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Our method of treatment, in general outlines, is as follows: Psychotherapy must follow immediately upon a prompt diagnosis, keeping the patients close to the front area, continually admonishing them to return to duty, calming their fears so far as possible, and, when the condition becomes chronic, evacuating them to stationary hospitals and the interior, constantly bearing in mind the efficacy of mental and physical occupations, always with the objective of a " return to duty ", as well-balanced and useful citizens, rather than as delinquents or dependents.

Smith Ely Jelliffe (United States of America).

In the fourth part of America's official report, *The Immediate and Remote Effects of the World War on the Nervous System: Psychopathology and War Residuals*, by Smith Ely Jelliffe, M. D., of New York, N. Y., he stated:

> The war residual has come to live his private life apart. His tendency to permit himself to be hospitalized is a part of this withdrawal of libido from the world of reality. How to get him out of this slough of despond, improve his morale, and return him to society at a higher level of efficiency—this is the task of an enlightened psychotherapy founded upon a rational psychopathology.

The following is his—

Summary of Conclusions

(1) To appreciate the possibilities of enlightened psychotherapy of residuals of the psychoneuroses of war, one must know something of the underlying psychopathology.

(2) There is no excuse for the term " abnormal psychology " which is not synonymous with psychopathology.

(3) In one way or another, the war residuals, considered as a class, suffer chiefly from a lowering of " morale ".

(4) To blame lowering of " morale " to heredity is to discourage psychotherapeutic endeavor.

(5) Not so, however, as regards the influence of fatigue, actual somatic trauma, or emotions.

(6) Psychoanalysis offers the greatest methodological instrument for psychopathology in the technical study of the psychoneuroses, because it is by this means alone that the resistance and repressions, which are kept out of consciousness, can be bared.

(7) Every war psychoneurotic has repressed material which interferes with his reaching a high state of morale. His resistances keep him always on the alert. He is vigilant to protect his holdings.

(8) All behavior—metabolic, sensorimotor, psychical, social—is correlated with a state of universal reactivity (vigilance), with its checks, displacements, and adaptive responses.

(9) The unconscious influences all behavior, even that of the electrons.

(10) In the metapsychological terminology of Freud, "repression" operates and permits to come into action those forces of the "id" that can be passed upon by or are acceptable to the "ego" as already influenced by the adjuvant mechanisms of the super-ego. Without adequate repression, hypervigilance would result.

(11) A strong super-ego makes the work of repression comparatively easier; a weak super-ego permits the instinctive needs to sweep away the comparatively weak ego. Hence arise the innumerable compromises (conversion, substitution, projection, etc.).

(12) Repression has conservative as well as reparative functions.

COMMUNICATIONS

Turner (Great Britain).

A communication by Dr. Alden Turner, F.R.C.P., England, took up the after effects of war neuroses in officers. A large number of officers have come before the British Medical Board who, during the period of 1914–18, suffered from a temporary form of functional nervous breakdown. Many have made a complete recovery and subsequently carried on their duties with efficiency. On the other hand, there are cases in whom some degree of nervous instability has become induced by the strain of war experiences and this reduction in the nervous resistance has favored, especially in those of a neuropathic constitution, a relapse under any special strain, such as the return to duty under the conditions of foreign service, an infectious disease, a concussion, or ordinary service peace-time risk. From a survey of a number of cases, it would appear as if those who had been prisoners of war were especially prone to some form of neurasthenic breakdown when submitted to conditions favorable to its development.

The most common post-war neuroses observed among officers are:

(1) Neurasthenia, in the sense of a temporary mental and physical reduction or depression associated with debility or exhaustion.

(2) Emotional or anxiety neurosis. This was a common form of neurosis in officers during the war, and is probably the most frequent of the psychoneuroses observed both in civil and military practice.

(3) Cases with an organic basis: The cerebral concussion group, where some degree of "commotion" of the cranial contents has occurred; and the closely allied group of minor gunshot wounds of the head, mainly scalp wounds, in which radiological evidence is negative regarding fracture of the skull.

(4) Epileptic reactions: Traumatic epilepsy, direct or doubtful, and eventual psychogenic epilepsy. The author's experience in this matter is in favor of the view that psychical or emotional causes may give rise to seizures differing in no respect from those of so-called "essential epilepsy".

Attention is called to the report, issued under Government supervision, of a committee appointed by the British War Office in 1921–22, to enquire into and collate the expert knowledge bearing upon those conditions which are included under the term "shell shock".

Pekelsky (Czechoslovakia).

Pathogenesis of the Injurious Effects of War on the Nervous System, was described in the communication of Dr. Antonin Pekelsky, Medical Major, Chief of the Neurological Section of the Divisional Hospital 6 (Czechoslovakia). All the functional nervous diseases originating under the influence of war injuries and described in the official reports, are to be considered as psychogenic diseases, functional disturbances of the cerebral cortex, without microscopical lesions. The same can be said of the neuroses of the vegetative system, for its centers are likewise situated in the cerebral cortex, thus accounting for the close relations between the cerebral cortex and the vegetative processes. This vulnerability of the cerebral cortex, with respect to war injuries, is presumably to be explained by the weakened resistance of this phylogenetically recent organ.

The knowledge of the phylogenetic age was introduced into neurology especially by Edinger and Kappers, of the Central Dutch Institute for the Study of the Brain, in Amsterdam. Based particularly upon the work of Kappers, the author has constructed a "schedule of nerve centers according to their phylogenic age".

The vulnerability of a certain center depends not only upon its phylogenic age, but also on that of the central paths which are directly related with this center. The vulnerability of the center

increases with the disturbance of the phylogenetically older paths which are closely related to it or through the formation of phylogenetically more recent paths which have become connected with it. Under the influence of injurious causes, the phylogenic factor then becomes complicated by the pathoclinic (systemic) factor. In each center may be theoretically distinguished at least as many parts as there are afferent and terminal paths.

War injuries are of relatively recent date. They intensify to a hitherto unknown degree and extent, the age-old struggle for existence. It is, therefore, not surprising that these highly complicated injuries act in a grave fashion on the phylogenetically most recent cerebral structures: the cortical association zone and the psychic correlates of the physical activity of these centers. In the war neuroses, there is an example of local vulnerability preferably affecting the phylogenetically recent organs.

Pienknoski (Poland).

Pathogenesis of Hysterical Phenomena, Especially Motor, in War Psychoneuroses, from the Biological Viewpoint, was discussed in this communication of Commandant Etienne Pienknoski, Adjunct of the University of Warsaw, Physician in Chief of the Service of Nervous Diseases in the Hospital of the Medical Instruction Center in Warsaw.

The analysis of the nervous and psychic symptoms in 122 patients with war traumatisms (except one where the traumatism occurred outside of the war) permits the conclusion that psychoneuroses of hysterical type are the most frequent of war traumatisms (71 cases), especially where general convulsions are concerned (one third of all cases). The majority of the studied patients were from sixteen to twenty-five years of age. The traumatism consisted especially of general contusion. The observations concerned, for the most part, educated or semi-educated individuals (mechanics). The gravest immediate and remote psychoneurotic effects were caused by psychic traumatisms. Injuries of the head often give rise to immediate grave symptoms of psychoneurosis. Somatic lesions of the head (wounds, contusion) do not aggravate the prognosis from the viewpoint of chronicity of the psychoneurosis.

In order to produce hysterical symptoms, a traumatism must have a pathogenic factor. The process which influences the value of a traumatism, in the disease-producing sense, takes place in the organism itself, while the traumatism, irrespective of its strength and characteristics, plays only the part of eliciting agent.

The essential cause of hysterical symptoms is the inherent faculty of hysterical individuals to present the phenomenon of essential emotional disassociation in the domain of the primitive sensations. These primitive sensations, pleasant or unpleasant, represent an enormous force of the organism. Such primitive phenomena can not be exclusively classified among the psychic or the somatic processes. These phenomena are characteristic of the faculties of individuals belonging to an ontogenetic period, in which no distinction needs to be made between body and soul. The primitive sensations comprise a psychosomatic " creative force ", which remains unmodified in adults.

Hysterics lose the faculty of producing the emotional value of a given situation from the viewpoint of the organism as a whole. This valuation becomes pathological, false, fragmentary. After the establishment of the pathological symptom, the suggestive tendency is restored and at this moment begins the fixation of these symptoms and their modification, under the influence of arbitrary correction by the will.

The motility disturbances of hysterics reveal fragments of total motor syndromes, motivated through the " causality of the primitive sensations ". These total reactions, although very simple from the viewpoint of the primitive sensations, are very complicated from the pathophysiological viewpoint (logical causality). The motor phenomena of hysterics may be considered as the total or partial expression of the simple emotional-motor reactions of every organism, deformed by the will. The localization of the hysterical phenomena probably depends upon the constitutional peculiarities of the organism, which constitute the predisposing factor.

A single hysterical person may cause more disturbances and untoward accidents in the army than one hundred convalescents.

Vallejo Najera (Spain).

Fitness for Military Service of General Paralytics in the Stage of Therapeutic Remission was the subject of a communication by Comandante Médico Antonio Vallejo Najera, Director del Manicomio de Ciempozuelos (Spain). Malaria therapy and other pyrotoxic-therapeutic agents give rise, in general paralysis, to complete clinical and serological remissions, which may be practically considered as cures. These treatments induce the disappearance of the marginal symptoms of general paralysis, but are powerless against the general intellectual deficit, dependent upon the cerebral cortical necrosis.

The existence of an intellectual deficit which comprises very complicated higher psychic functions, unfits the general paralytic for active military life. The conclusion is reached that general paralytics must be relegated to auxiliary services, without responsibility.

Puusepp (Estonia).

Based on observations on disturbances of the muscular system in traumatic war neuroses, and extensive studies in about three thousand psychoneurotic patients—cases from the Russo-Japanese War, the World War, the Revolution of the Russian Army, and the War for Estonian Independence—Général-Major-Médecin Professor L. Puusepp, Consultant of the Estonian Army, Professor of the University (Estonia), pointed out in his communication that the predisposition for psychoneuroses increases with the duration and the hardships of war. He observed a case of paralysis of the lower extremities supervening in sleep, while the patient dreamed that he was crushed by a shell. This case is very interesting and demonstrative, because it shows that traumatic psychoneurosis is of psychic character.

Consiglio (Italy).

Tenente Colonnello Medico Placido Consiglio, Neuropsychiatrist in the Superior Medico-legal College of the War Ministry (Italy), pointed out in his communication on *War and Post-war Neuroses and Psychoses: Some Clinical and Medico-legal Aspects of the Same*, that the cases of war psychoneurosis are not only extremely numerous, but highly variegated and complicated. The same is true for simple anomalies of character and temperament, due to events incident to warfare or associated with and subsequent to, war wounds or war strain, and overexertion. Their complex and proteiform picture is here and there interwoven with the biopsychic constitution, momentary organic states, external physiopsychogenic factors, fatigue and exhaustion, emotional traumatism, and severe lesions, especially of the skull. Hence the complexity of the syndromes and the multiplicity of the cases, as well as the great number of "psychic cripples", whose psychogenic handicaps often persist for years after the war. The neuropsychiatry of war is complex and multiform, and post-war legal medicine is complicated, precarious, and difficult, both requiring adequate organization and experienced specialists well versed in the diverse syndromes of war psychiatry.

The conditions of war necessitate an adequate neuropsychiatric organization, sufficiently large and well equipped with a competent

personnel. A suitable distribution of the neurological and psychiatric material is called for, in hospitals, clinics, and insane asylums, under competent technical management and expert specialist control.

Levy (France).

Upon reading the official reports, Medical Commandant Fernand Levy (France), was struck by the variety of the terminology employed by the different contributors to the subject of (War Psychoneuroses.) He raised the question as to whether it is not necessary to unify and define such terminology.

The simple classification into syndromes of organic and functional psychoneuroses comes to mind; but the boundary line of these two states is arbitrary. The characteristic feature of a functional syndrome is the absence of lesions demonstrable by our actual methods of investigation; but the still rather wide scope of these phenomena will progressively diminish in favor of the organic syndromes.

Pryor (United States of America).

The following conclusions were presented by Captain James C. Pryor, Medical Corps, United States Navy.

(1) War, especially when it is of long duration, plays incontestably a part in the genesis and frequency of mental disorders observed in the course of hostilities. Psychopathic heredity, degenerative conditions, and morbid constitutional tendencies are not the sole cause of mental troubles. The occasional factors are of undeniable importance, and in times of war these factors are numerous and their rôle considerable: wounds, shocks, physical fatigue, psysiological misery, various intoxications (alcoholism), moral shocks, emotions. The rôle played by emotional shocks is of particular importance in the genesis of psychoneuroses, leading, during the war, to post-emotional syndromes and psychopathic conditions.

(2) But war has not created psychoses of a new kind, of a symptomatology or evolution hitherto unknown. No new morbid entity has been observed; only the relative frequency of certain psychoses has been modified—frequency of confusional states on emotional conditions, named during the war "shell shock" or "post-concussion syndrome". (These terms, however, have been wrongly applied at times. It is advisable to cease the use of such terms, or to limit their application to carefully selected cases.)

(3) The symptomatology of each war psychosis was, in its entirety, quite comparable to that observed amongst the same patients in time of peace, but this symptomatology has been colored by the events of war, of which it was a faithful reflection.

(4) The anti-social reactions provoked by the psychoneuroses of war have also been of the same character as those occurring in peace time, but they have assumed a special complexion due to circumstances connected with the war and have been followed by the most serious consequences in peace time, not only for the patients themselves and their entourage, but also for discipline in the armies.

(5) The responsibility for psychoneurotics produced by the war has been accepted by the State as regards the granting of disability pensions. In cases of delinquencies amongst cases suffering from psychoneurotic disorders, the medical specialist, called upon to give his opinion as to the penal responsibility of the patient, should be a psychiatrist. He can only formulate decided conclusions after a profound study of each particular case.

(6) Arrangements should be made in advance in peace time for the organization of the psychoneurotic service in the field. This service should comprise:

A. A neuropsychiatric center per army, organized at the main clearing-station and intended essentially for the sorting of patients suffering from neurologic or psychopathic disorders, the evacuation of serious cases, and for the treatment of all patients exhibiting disorders which can be cured within a short time.

B. Special provision for evacuation as regards personnel and material, which, in case of need, will be placed at the disposal of the regular evacuation trains.

C. A regional neuropsychiatric center, in each district, installed in the principal hospital of the larger towns, liberally supplied with specialized personnel and charged with: (*a*) a second sorting of the patients; (*b*) their division into three categories, namely, serious psychopathic cases needing asylum treatment; cases suffering from acute transitory disorders and benign cases (these should be treated at the regional center itself); and patients exhibiting curable psychoneuroses but requiring prolonged treatment. For the latter category, it is advisable to provide for the organization of secondary regional centers specially designed for the treatment of curable psychoneuroses ("minor mental cases").

(7) There is reason, therefore, in time of peace, to provide for the classification of cases of mental disorder by a medical board composed of competent psychiatrists, and for their special employment in war time, enabling them to render useful service. This solution is indispensable for men with mental weakness and for the application of the elementary rules of mental prophylaxis. This selection will be more difficult in countries with voluntary service.

METHODS OF HEMOSTASIS ON THE BATTLE-FIELD: STANDARDIZATION OF FIRST-AID MATERIAL AND THE MODE OF APPLICATION

OFFICIAL REPORTS

Praag (Netherlands).

Procedures of Hemostasis on the Battlefield, Unification of First-aid Material and the Conditions of its Application, was the title of the Netherland official report, written by Lieutenant Colonel S. W. Praag, Chief Surgeon of the Military Hospital in Utrecht.

Wounds of blood vessels have undoubtedly increased in frequency in the last wars, but it is difficult to obtain exact figures, and the official statistics are necessarily insufficient in this respect.

According to experienced war surgeons, the number of vascular wounds directly inducing death amounts to 40–45 per cent of the total number of slain, while only slightly over one half of the wounded, suffering from vascular lesions, arrive at the aid posts. A certain number of these wounded undergo amputations because the grave secondary injuries of bones and soft parts prevent all conservative treatment. On the other hand, after having stopped the hemorrhage by means of a ligature, secondary amputation of the affected limb may be required on account of gangrene; or the secondary hemorrhage or infection may lead to death. All these cases no longer figure as vascular wounds in the clinical histories or final documents, so that the statistics convey an erroneous idea as to the actual situation. Likewise, statistical data afford no precise information as to the greater exposure to injury of the vessels of the lower than the upper extremities.

Gunshot wounds of the peripheral arteries are most frequently found in the region of the femoral artery, and next in order of frequency, in the subclavian, popliteal, axillary, brachial, and carotid arteries.

Arterial hemorrhages, particularly, require medical assistance and surgical intervention, but ordinary venous hemorrhages may, likewise, endanger life through inappropriate treatment. Unless hemorrhages from the large veins promptly receive the necessary care,

they often terminate in death, especially wounds of the neck, as a result of embolism.

As the source of hemorrhage, the heart, as well as the vessels of the major and minor circulation, enter into consideration. Wounds of the heart are of no practical importance with respect to hemostasis on the battlefield, because they are nearly always fatal. However, literature contains a few relatively harmless cases, with recovery even without operation. Hemorrhages from vessels of the minor circulation are very common, and of practical importance. Aside from external hemorrhage, they give rise to more or less profuse hemorrhage into the pleural cavity, as well as to hemoptysis. The loss of blood itself does not cause death in these cases, the fatal outcome being due to inactivity of the compressed lung. The majority of hemorrhages, however, result from wounds of vessels of the major circulation. Lesions of the large arteries, such as the axillary, subclavian, carotid, and femoral, almost invariably prove fatal on the battlefield, as the result of hemorrhage. Spurting hemorrhages, due to lesion of a large vessel, a large artery or vein, do not even reach the first-line aid posts. In a few exceptional cases, spontaneous hemostasis has been known to occur.

On the battlefield, surface hemorrhages, where the blood escapes from numerous small vascular openings, are most frequently observed. These are from the small muscular vessels and those of the bone marrow. Fractures due to gunshot wounds in the lower limbs, notably the femur, as well as wounds of the gluteal and lumbar region, because of the thickness of the crushed muscles, are the frequent seat of hemorrhage of this type. Wounds of the skull are also often accompanied by considerable hemorrhages; the face and the hairy scalp possess an abundance of blood vessels, which, after division, have only a very slight tendency to retraction.

A spontaneous arrest of hemorrhage, as may occur under favorable conditions, is often misleading, for the danger of an ulterior hemorrhage persists. Artificial hemostasis, provisional and definite, is the absolute rule, under all possible circumstances. All casualties with a vascular wound, but especially those who have received temporary aid by means of a tourniquet or provisional clamps, must be labeled and marked with a very obvious sign, as in the following aid post, it is important that they be classed among the most urgent cases. Irrespective of the utilized method of provisional hemostasis, it must be followed by definite hemostasis as promptly as possible. This should consist in ligature of the proximal as well as the distal portion of the damaged vessel. However, this ligature can be applied only in

a place where operation under aseptic conditions is guaranteed; in the Netherland organization, for example, at the divisional aid post. Catgut is now generally utilized as the ligature material.

Transfusion as a hemostatic procedure does not enter into consideration on the battlefield.

The preceding considerations lead to the formulation of the following—

Conclusions

(1) Vascular lesions occur frequently on the battlefield, and about 50 per cent of them result in immediate death. All wounds of the large blood vessels of the neck and limbs, except in rare cases, terminate in death after a few minutes. Consequently, the question of hemostasis in these cases need not be discussed.

(2) As regards other vascular lesions, it is necessary to distinguish, from the viewpoint of hemostasis, treatment at the front line, at the regimental aid post, and at the divisional aid post. In the front line and at the regimental aid post, it will usually not be possible to apply more than provisional hemostasis. In the front line, hemostasis is restricted to procedures which can be applied by the wounded soldier himself, his comrades, and the available medical personnel; it often consists of simple compression dressings (first field dressing) or of constriction by more or less primitive means.

(3) The medical personnel can not be too carefully instructed as to the dangers involved in the application of constriction, which should be permitted only in emergency cases. The medical personnel should, moreover, be familiar with the less dangerous hemostatic methods, which consist in elevation of the wounded limb, extreme flexion of the neighboring joints, and digital pressure on the affluent vessels, in the wound itself or outside.

(4) At the regimental aid post, the military surgeon must limit his work of constriction to the wounded absolutely in need of it, namely, casualties with spurting vessels, which are very rarely seen here. Incomplete constriction should be utilized as much as possible, guarding against grave lesions. Whenever the elastic tourniquet is required, a very thick elastic tube should be employed for the lower extremity, provided with the Samway Anchor Pattern; and for the upper extremity, a wide rubber band or the Nord compressor. A complete ligature of this kind may be left in place for three or four hours, at most. When no rubber is available, it is advisable to use

Sehrt's forceps, which can be easily and rapidly applied, and has only one disadvantage, that of not being compact.

(5) All the wounded who have received the foregoing aid must be distinctly labeled.

(6) In the majority of cases, it will prove possible to obtain provisional hemostasis by means of:

(*a*) Compression dressings;
(*b*) Packing (plugging) of the wound;
(*c*) Closure of the wound either by suture or with Kocher's forceps, with or without tampon;
(*d*) Application of provisional forceps.

(7) At the regimental aid post, the clots should not be removed, in order not to provoke fresh hemorrhage. It is advisable to have in readiness during transportation, a provisional tourniquet, for the use of those in whom a recurrent hemorrhage is feared.

(8) Definite hemostasis should be attended to only where experienced surgeons can intervene in a suitably aseptic manner.

(9) The unification of material destined for first aid on the battlefield should receive the attention of the International Permanent Committee for the Standardization of Medical Material, in Geneva.

Caccia (Italy).

The first part of Italy's official report was submitted by Colonel Filippo Caccia, Adjunct Professor of Traumatology, University of Rome, Director of the Army Medical Corps (Italy), under the heading *Methods of Hemostasis on the Battlefield: Standardization of the First-Aid Material and Modality of its Application.*

In connection with hemorrhages on the battlefield and their manifestations, it is necessary to take into consideration the variegated modern vulnerating agents and the anatomopathological lesions caused by them. Vascular wounds in modern wars are practically exclusively produced by firearms. Statements vary as to the frequency of such injuries. In a total of 5,263 wounded—of whom 70 were not transportable—who passed through the hospital center of an army corps (offensive of September–October, 1918), 204 wounded were inoperable because of the gravity of their condition, and 1,083 were operated on. Ligatures for vascular lesions amounted to 122, namely, one ligature per 43 wounded and one ligature for every eight operations of other kind.

In view of the great variety of modern firearms, it is evident that the resulting anatomopathological lesions must be extremely varied.

War projectiles may cause vascular wounds; contusions; arterial "stupor" (stunning). From the anatomical viewpoint, vascular wounds may be partial (lateral or perforating), or total (transverse division of the entire substance of the vessel). Lateral wounds are common and more or less extensive. Vascular perforations are rare. Perforations of both vascular walls are more frequent than those of a single wall. The orifices are more or less extensive, with smooth or ragged margins. Total wounds (complete division) are also rather common. Arteries and veins are subject to the same lesions but both present noteworthy anatomical peculiarities. Simultaneous wounds of arteries and veins are rather frequently observed. It is not uncommon for the same projectile to produce lesions of several vessels (superficial and deep femoral vessels, common carotid and vertebral artery).

In the Surgical Hospital, City of Milan, the vascular lesions in 65 cases were complicated by fractures, in 11 cases by nervous lesions, in 9 cases by lesions of other organs. Four cases presented multiple vascular wounds (femoral and profunda femoris).

Vascular contusions are rather common and are produced by various causes, such as spent projectiles or those which have struck the vessel at a tangent—injury transmitted from a distance through several traumatisms. Vascular contusions may be more or less severe—first, second, and third degree. On external examination, only a retraction of the vessel is demonstrable at the contused point. When the contusion is grave and extensive, sphacelus may supervene. Venous contusions, which are less frequent than the arterial, often have subsequent complications, but rarely give rise to hemorrhages, are always secondary and therefore beyond the scope of the present consideration.

Greater importance is attached to so-called arterial stupor or segmentary inhibition of the arteries. A distinction is made by Veau between three degrees of arterial stupor:

(1) barely marked, by a simple, not clinically demonstrable vasoconstriction;

(2) characterized by a momentary arrest of the circulation in a vessel;

(3) finally, characterized by complete and definite arrest of the circulation, with subsequent vascular gangrene (extremely rare). It is noteworthy that genuine arterial stupor may exist without any demonstrable macroscopical lesion of the vessel. From the clinical viewpoint, it is important that there exists no differential symptom for a distinction between arterial stupor

and vascular thrombosis. This knowledge is necessary with respect to the therapeutic measures, as indicated in the regimental aid posts.

The general methods of provisional hemostasis which were adopted in practically all the fighting armies of the various nations in the World War, consisted in:

(1) Compression at a distance from the wound. This procedure may be efficiently applied on the limbs, above the wound, between the injury and the heart, directly on the battlefield. Nearly all the belligerent nations employed the hemostatic tube for this purpose.

(2) Compression, applied directly to the wound. This method may be found useful especially on the battlefield, in the ranks of the fighters. This immediate compression acts directly on the vascular lesion, namely, the source of the hemorrhage, and may be applied:

(*a*) with tampons of variable size;
(*b*) with the fingers.

Each of these procedures naturally has its own special indications. Direct digital compression is alone possible, for immediate control, especially at certain sites, such as the neck and the supraclavicular region.

(3) Irrespective of the mode of direct compression, it is not possible to apply it in an efficient manner in arterial hemorrhages at the base of the neck, without interfering with the air passages. In these circumstances, provisional occlusion of the cutaneous wound has been successfully applied as an emergency measure, when no other procedure is possible.

From the viewpoint of treatment of wounds of the vessels of the neck and its base, a distinction must be made between superficial wounds situated above the superficial aponeurosis and deep wounds situated below it. The vascular lesions in superficial wounds of vessels of minor importance, including the external and anterior jugular, give rise to hemorrhage easily controlled by light compression dressings. Deep vascular lesions concern especially the internal jugular vein or the carotid artery, often the artery and vein simultaneously. There may also be a simultaneous lesion of the inferior thyroid and the vertebral artery. At the base of the neck, the innominate trunk, the subclavian, the initial portion of the carotid, and the

corresponding vein may be wounded. The vascular wounds of the neck and its base take a different course, according to the vulnerating agent and the anatomical lesions caused by it. The majority of such lesions with a large opening are beyond all aid and prove immediately fatal. Among thirteen cadavers seen by the author in the Libyan campaign, death was due in four cases to gunshot wounds of the large vessels of the neck. Casualties may reach the aid post in a state of syncope, with vascular lesions of the neck and gaping wounds temporarily closed by a blood clot, but due to transportation, an alarming hemorrhage may supervene (retarded hemorrhage). Usually, however, cases with vascular wounds of the neck which reach the aid post, present lesions with a restricted orifice and wound tract, which guard against external hemorrhage of a severe type. Various eventualities are possible: a jugulocarotid fistula may promptly form, and some cases of this kind have been described without demonstrable periarterial hematoma. The absence of hemorrhage and hematoma has been observed, due to small splinters occluding the vessels or to retraction of the vascular layers (dry vascular wounds).

In the presence of wounds at the base of the neck, immediate death on the battlefield is very common. Wounds with vascular lesions and a narrow wound tract were only rarely seen in aid posts. It is also possible for a profuse internal hemorrhage to supervene in vascular wounds at the base of the neck (hemothorax, hematoma of the loose cellular tissue at the base of the neck). In these cases, immediate death is the rule, although favorable cases of dry wounds or of spontaneous hemostasis have been reported. Makins, among seven collected cases of wounds of the subclavian vessels, reports two recoveries, with concomitant hemothorax.

The treatment of wounds of the neck and its base must consist in the control of the external or delayed hemorrhage, when present, and in its prophylaxis.

Stretcher bearers, when confronted with active hemorrhage, must restrict themselves to direct digital compression of the wound and to summoning the surgeon, as it is not yet possible to transport such casualties. Medical officers, in the presence of wounds of the neck, must proceed to compression with tampons. In widely open wounds, tamponing or plugging, according to Mikulicz, may prove useful, with adjustment of a regular compression bandage. In gaping wounds at the base of the neck, when compression dressings are not practicable, the medical officer must resort to tamponing, followed by occlusion of the wound with clamps or, when the condition per-

mits, to cutaneous suture or, preferably, to forcible compression of the bleeding vessel. In sluggish, stagnating wounds, it is advisable to adopt the same procedure, for the purpose of preventing delayed hemorrhages, which are apt to occur as the result of transportation.

Lesions of the axillary vessels and vessels of the upper limb: Wounds of the axillary vessels are much more common at the aid posts than those of the neck, and lesions of the vessels of the upper limb are extremely frequent. In the statistics compiled by the author on the vascular wounds observed by Italian military surgeons, 10 per cent of the lesions were of the axillary vessels and 22.7 per cent of the upper limb. All these lesions do not show any unusual features. The anatomoclinical behavior and the therapeutic indications here are the same as in vascular lesions in general. But it is noteworthy that in lesions of the axillary vessels, wounds with a small tract are observed with a certain frequency, complicated by internal hemorrhage (hemothorax, axillary interstitial hematoma). The greatest number of dry wounds were observed in the axillary vessels. Furthermore, the very common simultaneous lesion of the axillary artery and vein and of the brachial plexus is noteworthy. Therapeutically, the hemostatic tube is applied by the medical officer in the case of verified arterial wounds, and only when a compression bandage fails to control the hemorrhage, which is extremely rare.

Wounds of the pelvic vessels and the vessels of the lower limb: The pelvic vessels (common, internal, and external iliac), being deeply situated in the cavity of the pelvis, are wounded separately only in exceptional instances. But the internal hemorrhage is so profuse as usually to induce immediate death. Cases of recovery from vascular lesions of this kind, although rare, have been reported. Also, in the iliac vessels, quiescent lesions and, sometimes, arteriovenous fistulas without hemorrhage, have been encountered. Wounds of this kind are naturally not amenable to treatment on the battlefield and at the aid posts. The pelvic vascular lesions most frequently observed are those of the external iliac and the extrapelvic branches of the hypogastric artery.

The Italian statistics contain four lesions of the iliac vessels—only one of the common iliac vessels (artery and concomitant vein), and three of the gluteal arteries. Such cases were never observed in the advanced aid posts, because the branches of the internal iliac artery practically never give rise to external hemorrhages. At all events, in the case of primary external hemorrhage from the intrapelvic iliac vessels, nothing can be done but to apply the Momburg band or, preferably, the apparatus devised by Pomponi; however, neither of

these appliances can be utilized in the first lines. These contrivances are not practical, and such lesions, which are rarely isolated, require laparotomy interventions, possible only in the surgical units.

The femoral vessels are very frequently wounded, especially in the region of Scarpa's triangle, due to the superficial situation of the vascular trunks. Hematomas, sometimes voluminous, have been observed as a result of lesions of the collateral branches (circumflex or anastomotica magna) without lesion of the femoral vessels. Simultaneous lesions of the femoral artery and vein are common.

The therapeutic indications are, as usual, with slight modifications. In external hemorrhages in Scarpa's triangle the hemostatic tube is not applicable and a compression bandage has preference. When this does not meet the purpose, it is advisable to resort to provisional occlusion of the wound with clamps. In more peripheral external hemorrhages, compression dressings are always indicated, because the hemostatic tube above the wound can not arrest a venous hemorrhage.

The popliteal vessels are also damaged rather frequently and chiefly present narrow wounds with perivascular hematoma. Vascular wounds of the leg and foot are extremely common, associated with simultaneous grave fracture of the tibia. The therapeutic indications in external hemorrhage consist in the application of compression dressings, which induce a sufficient provisional hemostasis. In wounds of the popliteal vessels, additional fixation of the leg in forcible flexion may prove advantageous.

The incidence of vascular wounds of the lower limbs contained in the Italian statistics collected by the author for the International Congress of Military Medicine in London, is as follows:

Femoral vessels	24.4 per cent
Popliteal vessels	8.9 per cent
Tibial and peroneal vessels	21.1 per cent

Conclusions

(1) Wounds by war projectiles do not frequently give rise to vascular injuries with external hemorrhage, which are immediately amenable to provisional hemostasis.

(2) Primary external arterial hemorrhages are often immediately fatal on the battlefield, and those which are curable must be treated with provisional hemostatic measures.

(3) The methods of first-aid hemostasis, advisable on the battlefield at the present state of our knowledge, are as follows:

(a) By the wounded man himself or those near him: Direct digital compression, with individual dressings or other im-

provised means, while waiting for the arrival of the stretcher bearers and assistants. For this purpose, all soldiers should receive instruction on hemostatic procedures.

(*b*) By the stretcher bearers or regimental assistants: Direct compression on the wound, with specially prepared medicated tampons (dressing plugs) and elastic bandages.

(*c*) By the medical officers at the regimental aid post: In case the application of the foregoing direct compression fails to arrest the hemorrhage, indirect or mediate compression must be applied above the wound with the hemostatic tube or preferably, if possible, with hemostatic clamps. In so-called dry vascular wounds which do not bleed, direct compression is indicated with the hemostatic tube applied around the limb, in readiness to be tightened in case of supervening hemorrhage. Definite hemostatic tightening must never be applied outside of a suitably equipped aid post.

(4) The various apparatus do not meet the requirements of provisional hemostasis at the front, because they are not easily applied by the stretcher bearers and are not practical. In conformity with the rules of Maisonnet, they should have the following requisites:

(*a*) Sufficient width, so that the pressure on the part may be exerted over an extensive surface;

(*b*) Adequate elasticity;

(*c*) Easily flexible and removable, but strong;

(*d*) Easily applied;

(*e*) Relatively inexpensive and numerous, for the outfit of the Medical Service in the field;

(*f*) Recognition of the uselessness of the "fixed cushion", which moreover, is easily improvised when called for.

For the time being, the hemostatic tube is still considered as the most practical measure, best answering the purpose, but it needs an easier mechanism of fixation and removal (for example, the Finocchietto-Putti apparatus).

(5) The unification of the material for first-aid hemostasis is considerably difficult, due to the different opinions of the military surgeons of the various nations. Only an international committee of qualified surgeons might accomplish it, in response to the great humanitarian aim which is its inspiration. (Such a committee would eventually meet in Geneva: Permanent International Committee of Standardization of Medical Material.) Once the first-aid

material is established, the conditions of its application will naturally follow.

(6) The procedures proposed by the author and the modality of application are, in his opinion, a useful starting-point for the important question of hemostasis.

Casella (Italy).

The second part of Italy's official report, *Methods of Hemostasis on the Battlefield: Action of the Hemostatic Tube in the Determination and Aggravation of Traumatic Shock; With Data on the Etiopathogenesis of the Same*, was covered by Colonel Dante Casella, Adjunct Professor of Surgical Pathology, University of Padua.

Colonel Casella devoted the greater part of his report to a discussion of traumatic shock. He mentioned the theory in vogue before the war, supported by Travers, Goltz, Boier, and Crile, that shock was of nervous origin. During the war the vast clinical experiences of a multitude of observers won support for the toxic theory supported by Quenu, Delbet, Bayliss, and Cannon. According to these, the symptoms of shock were caused by the rapid introduction into the circulation of certain products of cellular disorganization in traumatized tissues.[1]

A synthetic review of the action of the hemostatic tube in the determination of shock resulted in the following conclusions:

(1) Although studies and experimental investigations have been conducted most seriously and objectively, they have not led to any unanimity of opinion.

(2) However, the fact remains that shock—whether dependent upon a nervous, toxic, endogenic, exogenic, or anaphylactic cause or whether, instead, the result of a coincidence of these various factors, combined with the peculiarly depressing conditions of time and place, which act upon the soldier—not only can be aggravated by the application of the hemostatic tube, but this is capable of being the determining factor in shock, even when applied to an intact, undamaged, and healthy limb. The effect will not be a genuine shock, in the true sense of the term, but secondary or delayed, a pseudoshock or collapse. However, it is certain that all of the phenomena, supervening after the re-

[1] This theory of the production of shock by the absorption of cellular toxins was fully discussed in the *Military Surgeon*, issue of May, 1929, by Dr. Fenton B. Turck of New York, who had published this theory, fully supported by experimental evidence, as early as 1897.—Editor.

lease of the hemostatic band, have features closely identical with genuine shock, as regards the gravity of the prognosis.

(3) The studies still under way in the Padua Surgical School, with respect to the action of cold wet dressings or of hydrogen-peroxide bandages, on the cutaneous respiration of the limb withdrawn from the circulation by the hemostatic tube, have yielded excellent results. It is to be anticipated that experiments for the respiration of the deeper layers may furnish the hoped-for results. Thus by applying cold wet dressings or hydrogen-peroxide bandages to limbs bearing a hemostatic tube (measures easily provided or extemporaneously improvised with compresses), in a battalion or at a regimental aid post, sufficient respiration of the tissues may be secured, rapid tissue disintegration prevented, and early infection retarded during the period of time between the instant infliction of the injury and the admission of the wounded to the surgical unit.

A brief survey of some hemostatic appliances and apparatus was given by the author, which served to illustrate the interest that has been aroused in the solution of this important problem. He stated, however, that although some of these contrivances may substitute for the hemostatic tube in the operating-room, none provides the security and rapidity of application which are absolutely necessary on the battlefield. An apparatus named "Hemostator A. S." was invented by Singer, in Warsaw (1929), who noted the grave inconveniences of the elastic tube, which does not permit regulation of constriction, as its pressure depends upon the strength of the person who applies it. The arrest of the entire circulation of a limb may result even when the compression of but a single damaged vessel is indicated. Aside from causing gangrene of the limb, if prolonged beyond two hours, this constriction may give rise to grave phenomena of shock in a shorter period of time. Furthermore, the hemostatic tube, while serviceable for the limbs, is poorly adaptable, or not at all adaptable to other parts of the body—the head, neck, thorax (intercostal arteries). All these disadvantages are claimed to be eliminated by Singer's apparatus:

A. Hemorrhages from single arterial trunks can be arrested without shutting off the circulation of the extremity; furthermore, hemorrhages from the jugular, frontal, humeral vessels can be checked.

B. The wounded may, without special supervision and in less time than if a hemostatic tube had been employed, be trans-

ported from the place where the wound was sustained to the second-line hospital section, without risk of gangrene and, especially, of shock.

C. A complete arrest of the circulation can be accomplished, if necessary.

D. The apparatus is provided with a very accurate regulator of the pressure, and accordingly permits the control of the onset of any lesion of the tissues.

E. It is very strong and easily manipulated.

As a matter of fact, this apparatus complies with many necessary requirements and can be recommended as a substitute for the hemostatic tube. Its adaptation to any portion of the body, more particularly the head, neck, thorax, and limbs, the possibility of regulation of the pressure, which although it may at first involve difficulties on the battlefield, is easily managed later on, the fact that the region below the "Hemostator" is withdrawn from the circulation only in the limited portion of the damaged vessel, hence the elimination, in a large measure, of the danger of shock and gangrene, with limitation and restriction of vascular, nervous, and muscular lesions—all these factors represent a long step towards the realization of absolute hemostasis, free from the late dangers of shock and gangrene.

Professor Cassella's report is enriched by an historical survey of the methods of immediate provisional hemostasis, with special reference to hemostatic bandages.

COMMUNICATIONS

Fredet (France).

In his communication on *Hemostasis on the Battlefield*, Medical Lieutenant (Reserve) M. Fredet, Surgeon of the Hôtel Dieu of Chartres (France), pointed out three rather special items in connection with hemostasis on the battlefield. The first refers to a stretcher model which permits the transportation of the wounded, with the bleeding region placed in an elevated position. The second point regards the utilization of hemostatic clamps or forceps, a valuable measure for the control of hemorrhage. These hemostatic clamps are most serviceable in particular for the control of hemorrhage from wounds of the heart, the neck, or the thorax. The third point concerns the employment of Mikulicz dressings as a tamponing-procedure in bleeding wounds. In war surgery, the Mikulicz tampon has the following advantages:

(1) It is not bulky and can be preserved sterile in boxes of small dimensions.

(2) Its cost is minimal.

(3) It is especially suitable for the packing of deep and irregular wounds, where permanent clamps must be advantageously applied.

The employment of hemostatic clamps and Mikulicz dressings should be generalized. The use of the tourniquet must be restricted and reserved for medical officers; for often, when incorrectly applied, in the case of venous hemorrhage, it may aggravate the condition, and may ultimately cause gas gangrene, resulting either in the death of the wounded or in high amputation of the affected limb.

De Fourmestraux and Fredet (France).

The joint communication of Lieutenant Colonel (Reserve) de Fourmestraux and Medical Lieutenant (Reserve) M. Fredet, Surgeons to the Hôtel Dieu of Chartres (France), contains the following recommendations in the presence of hemorrhage:

(1) The omission of the tourniquet or, at least, its reservation for the battalion surgeon. It has only a few very precise indications. It is advantageously replaced by an Esmarch bandage or a pneumatic band which permits an optimal constriction.

(2) The medical personnel at the front should be equipped with sterile Mikulicz dressings, as well as with hemostatic clamps.

(3) In the case of dry vascular wounds, great care and precaution are required during transportation. The wounded should be labeled with a plainly visible sign, so that he may be operated upon at once after his arrival at the surgical ambulance.

Winters (Netherlands).

According to V. M. E. Winters, Medical Officer (Reserve) (Netherlands), who submitted a communication on *Hemostasis on the Battlefield*, a distinction must be made between two zones, on account of the nature of the operation; next, the danger involved, which is subject to the place of operation. The first zone is characterized by the medical aid given directly under the enemy fire; while the second zone, which is not exposed to infantry fire, affords an opportunity for the rendering of definite assistance.

For the control of hemorrhage, the ordinarily employed rubber tubes and tourniquets have the disadvantage of being too narrow,

and too constricting, which results in severe lesions of the tissues and nerves, or even in gangrene. Moreover, these rubber bands are difficult to handle and have no practical closing mechanism. In order to remedy these drawbacks, Doctor Vossenaar, Médecin-en-Chef of the Heerlen mines, invented a nonelastic strap with an automatic lock, which has the advantage of closing so firmly, due to the interior counterpressure of the tightened band, that it can not open of its own accord, while it can be removed by a single turn of the hand. This strap still has the disadvantage of being too narrow and of not being elastic. The author demonstrated an instrument which does away with these two drawbacks, because the band is of rubber and has a width of six centimeters, giving an equal compression without causing any lesion of the tissues.

Sanchez Gomez (Spain).

Lieutenant Colonel Dr. Joaquin Sanchez Gomez, Surgeon of the Spanish Navy and Professor in the Madrid General Hospital, presented a communication on *Hemostatic Procedures on the Battlefield.* (Original system of Dr. Sanchez Gomez, with automatic, metallic, reabsorbable vascular-ligatures.)

The author discussed his system two years ago, at the previous International Congress of Military Medicine and Pharmacy, in London; but great advances have since been made. The utilized metals can be sterilized more easily than catgut or silk; they can be applied more tightly; they are more solid; on application of vascular ligatures, there is no danger of their detachment or of their slipping on releasing the ligature, as happens sometimes with catgut. Suitable mechanisms must be employed for the application of these metallic ligatures. It is unnecessary to emphasize the practical importance of this system of automatic reabsorbable metallic ligatures, on the battlefield as well as in ordinary surgical practice.

Pâitre (France).

With respect to the mode of hemostasis at the aid post, Medical Lieutenant Colonel R. F. Pâitre (France), believes that the choice may be left to the initiative and judgment of the military surgeon. The selection depends upon clinical indications, anatomical knowledge, the adaptation of methods to the circumstances of war and to the length of the evacuations. Provisional occlusion of the wound by cutaneous sutures, tamponing, the application of a provisional

hemostatic band to be tightened only in the case of secondary hemorrhage, are to be taken into consideration, according to the gravity of the wound, its site, the more or less serious prospects of dry arterial lesions. The essential points of the question have not yet been settled.

It would be desirable to devise an ideal model of a hemostatic band and to agree on the precise instructions to be given to the stretcher bearers of all the armies, in order to standardize the material and the modes of utilization of this material.

THE PREPARATION AND STORAGE OF MEDICINAL AMPOULES IN USE IN THE NAVAL AND MILITARY MEDICAL SERVICES

OFFICIAL REPORTS

Roehner (Netherlands).

Military Pharmacist, First Class, L. J. Roehner, Chemist to the State Medical Depot in Amsterdam (Netherlands), in his official report, *Preparation and Preservation of Medicinal Ampoules in Use in the Medical Services of the Armies on Land and Sea*, stated that when it becomes necessary during war to proceed to the transportation, in a restricted space, of the most needed medicinal preparations for injection purposes, a selection of these products is required. Circumstances decide as to what is to be considered as indispensable. In certain regions, quinine or emetine ampoules are necessary and would be useless elsewhere. The author restricted himself to the consideration of a few ampoules in general use, namely, those which can be prepared in any pharmaceutical laboratory, exclusive of sera and of solutions requiring a physiological dosage.

With special reference to the glass, the author refrained from enumerating the necessary tests for the determination of its quality, since the physical and chemical analyses of such articles were reported upon at the Fifth Congress. The water for the solutions, must have been freshly distilled and, preferably, secured from a glass container. It is advisable to render the liquids as isotonic as possible with the blood serum. Filtration through filter paper or cotton must be regarded as sufficient, carefully guarding against the penetration of fibers into the solution. As to sterilization, the principal injection medicinal agents tolerate sterilization at 100° Centigrade. Some remedies which undergo changes in the state of solution, even without having been heated, do not lend themselves to preservation in this form. Such are, among others, the salts of apomorphine, eserine, and scopolamine.

As regards the use of antiseptics for the sterilization of injection liquids, 0.5 per cent of phenol has been added to sera and vaccines in many cases. Attention has recently been called to p-oxybenzoic acid and its methylic and propylic ethers. According to Sabalitschka

(1930), propyl p-oxybenzoate (Nipasol) has a several times stronger antiseptic activity than that of phenol. Experiments made by him revealed that medicinal solutions inseminated with microbes were rendered sterile in a very short time by the addition of minimum doses of Nipasol.

Novocaine-adrenaline: It has been shown that sterilization at 100° Centigrade may be applied in novocaine-adrenaline solutions. The combination of novocaine and adrenaline assumes a yellow coloration, even at ordinary temperatures, but is noticeable more rapidly after heating up to 100°. In order to counteract this effect, sodium bisulphate is generally utilized and its employment has been prescribed for novocaine-adrenaline solutions to be used for injections as well as for other purposes. The discoloration of the combination of novocaine with adrenaline, which is stimulated by heating, depends upon the presence of oxygen. If the volume of air, which is contained in the ampoule after sealing, were known, it would be possible to calculate how much sodium bisulphate is necessary to bind the oxygen. As this volume is not constant, a rather considerable quantity of sodium bisulphate must be used. From the fact that the solution in half-full ampoules after sterilization at 100° turns yellow after a relatively short time, even in the presence of 1 gram of sodium bisulphate, it proves that the quantity of air contained in the ampoules is of importance in this connection.

Morphine hydrochlorate: Sterilization at 100°. The solution tends to turn yellow, which can be prevented by adding sodium bisulphate in the quantity of 500 milligrams per liter.

Emetine hydrochlorate: Sterilization at 100°. Here again, sodium bisulphate may be added.

Atropine sulphate: Sterilization at 100° is prescribed in the table of preparation of the Tenth Subcommittee of French Rules for Injection Preparations. The Dutch Pharmacopeia prescribes tyndallization.

Quinine: As a rule, strong solutions are employed, for example, 500 milligrams or 250 milligrams per cubic centimeter of the neutral hydrochlorate or the same quantities of the basic hydrochlorate, which is usually rendered soluble by urethane or by antipyrine. The neutral hydrochlorate, which tolerates sterilization at 100°, has the disadvantage of attacking the tissues at the site of the injection, in consequence of its acid character. This explains the preference accorded to the basic hydrochlorate. The Dutch Pharmacopeia prescribes that the solutions of basic quinine hydrochlorate must be sterilized by means of tyndallization. Solutions of quinine urethane and quinine antipyrine, according to investigations conducted in the Netherland

Riks-Institute for Pharmacotherapeutic Research, must be sterilized at 70° by means of tyndallization.

Ergotin: The watery solutions of the thick extract have the disadvantage of ultimately forming a deposit. This can be somewhat guarded against by maintaining the solution for one hour at the temperature at which it is finally to be sterilized, and then keeping it in the cold for twenty-four hours. After filtration, it is transferred into ampoules and sterilized. Even this method is not efficient for the prevention of the formation of a deposit, so that such a solution can not be considered as stable. The liquid extract presents the same disadvantage when mixed with water. Mixed with alcohol at 70°, and glycerin, it remains clear. The "Formularium Medicamentorum Netherlandium" contains the following prescription for an injection liquid:

Fluid ergotin, 1.25 g.
Alcohol at 70°, 4 g.
Glycerin, q. s. p., 10 cm^3 (=10.5 g).

Tyndallization is the method of sterilization indicated for ergotin solutions.

Gelatin: The sterilization of gelatin requires special precautions, on account of the possibility of its containing resistant microbes, more particularly tetanus germs. The Netherland Pharmacopeia prescribes sterilization for half an hour at 110° on two successive days. The solution must be neutralized on litmus paper, with a decinormal solution of sodium.

Glucose: Sterilization here, likewise, demands special precautions. The Netherland Pharmacopeia prescribes heating at 100° for one hour on two successive days.

Camphorated oil: The Netherland Pharmacopeia orders the sterilization of oils by means of dry heating at 120° for two hours, so that this rule applies likewise to camphorated oil. However, the Tenth Subcommittee considers heating at 110° for twenty minutes as sufficient.

Camphorated ether: Sterilization may be said to be superfluous in this case. As the ether is altered by light, the employment of inactinic glass is preferable.

Conclusions

(1) The glass of ampoules must comply with the strictest requirements, with respect to its giving off soluble material, more particularly alkali.

(2) Watery solutions for injections should be, so far as possible, isotonic with the blood serum.

(3) Among liquids for injection, which have to be preserved for a long period of time, those should rank foremost which do not require sterilization and those which tolerate sterilization at 100° Centigrade (212° Fahrenheit).

Grintzesco and Bibesco (Rumania).

The official report, *Preparation and Preservation of Injection Solutions Employed in the Military Medical Services*, by Colonel G. Grintzesco, Chief Pharmacist of the Military Service, and Captain J. Bibesco, of the Central Laboratory of the Army (Rumania), is based on a selection of the most practical, most expeditious, and, at the same time, most reliable methods for the preparation and preservation of injection solutions. Credit for the idea of preparing and injecting these solutions is due to Fourcoy, who, in 1785, first raised the question of subcutaneous introduction of active substances into the tissues, where they undergo absorption and reliably exert all the effects of which they are capable. This reliability, however, depends on the proper preparation of the substances to be introduced into the organism, through the various measures of subcutaneous, intravenous, and other injections. In the preparation of these injection substances, it is necessary to be sure, in the first place, that the utilized active principles are absolutely pure, i. e., give the guaranties of purity exacted by the rules or the pharmacopeia of each country; next, the utilized excipients must always be tested. The most commonly employed solvents are distilled water, olive oil, vaseline oil, lanolin.

Solutions for injection must be preserved in the cold and as aseptically as possible, resorting to heat only when necessary. The liquid must not be directly boiled, for this would mean a risk of its concentration, and in certain cases air boiled in might result in an alteration of the product. The solutions must be clear, and filtration is carried out through hydrophilic cotton or preferably through filter paper. When fatty substances are used, the funnel, the filter, and the receptacle must be kept in a dry-air thermostat, at 120°, for the entire duration of the filtration. These aseptic precautions are extremely necessary when the solutions or mixtures can not undergo sterilization by the ordinary procedures, without alteration; in these circumstances, the utilized excipient (distilled water, olive oil, fatty substances) must first be sterilized. The solutions are distributed in different receptacles, in glass ampoules.

The term ampoule is applied to glass receptacles in cylindrical, spherical, or ovoid form, terminating in one or two pointed extremities. The simplest ampoule is a glass tube pointed at its two ends. The capacity may vary from 1 cubic centimeter to 50 cubic centimeters. Those with a greater capacity, 125–250–500 cubic centimeters destined for saline or sugar solutions, usually have two pointed extremities, one serving for the adjustment of the desired pressure. The glass must be of good quality.

The filling of the ampoules with the prepared injection solutions can be carried out in different ways, through a graduated burette, or by means of a vacuum apparatus for industrial purposes. The closure of the ampoules can be done by exposing the extremity to a Bunsen burner, guarding against overheating.

After the preparation and distribution of the solutions in suitable receptacles, they must be sterilized, and this sterilization is governed by the nature of the active substance, according to its being alterable or not by the action of heat. For this reason, recourse is had either to sterilization in an autoclave for fifteen to twenty minutes, at 120°, or in a vessel of boiling water for three days at least, from thirty to forty minutes daily. One of the principal causes of alteration of the active substances is that the solutions remain in the ampoules for a prolonged period of time, for the composition can always be modified, as no glass can resist the prolonged action of water.

In the testing and selecting of ampoules, the authors used the known procedures, such as that proposed by the Subcommittee of Rules for Injection Preparations (phenolphthalein test), the method of Baroni, and the spectral indicator of Bruère. For the first procedure, the ampoules are well washed with a solution of sodium carbonate, followed by washing with 10 per cent hydrochloric acid, and repeated rinsing in neutral distilled water. The ampoules are filled with distilled water and kept in an autoclave at 120° for one hour. On 50 cubic centimeters of this still slightly warm water, one determines the dosage of the alkalinity liberated by the remainder, utilizing centinormal sulphuric acid and phenolphthalein as the indicator. The results are referred to 100 cubic centimeters of sterilized fluid. For neutral glass, and under these conditions, at most 1 cubic centimeter of centinormal solution should be employed for 100 cubic centimeters of solution. It is preferable to use alizarin sodium sulphate as the indicator, as it gives reliable indications, in a neutral, acid, and alkaline medium. In their experiments the authors utilized this exclusively.

Baroni recommends the adding of phenolphthalein to the solutions and their sterilization for one hour in an autoclave at 130°. If no persistent pink color is produced, the glass is acceptable. He also advises the utilization of hematoxylin as indicator, as it is more sensitive than phenolphthalein, especially with glass containing zinc. The coloration takes place slowly in weak sodium-hydroxide solutions, but the violet coloration is quite visible. With the addition of 3–4 cubic centimeters of helianthin, to 10 cubic centimeters of distilled water sterilized in ampoules, no rose or violet coloration must occur in twenty-four hours.

The authors also tested the reaction of glass by the use of other indicators—colorimetric scales, controlled by potentiometers, and the spectral indicator of Bruère. They conclude from their experiments, which are in complete conformity with the results of various writers, that:

(*a*) A given glass is of very good quality when the solution of bromothymol blue is not altered at 130°, and methylene red at ordinary temperature.

(*b*) Glass is of good quality when bromothymol blue does not turn green or greenish-yellow at 134°, and methylene red is not altered at ordinary temperature.

(*c*) Glass is of medium quality when bromothymol blue is of a blue color at 134°, phenolphthalein remains unchanged, and methylene red is colored pink at ordinary temperature.

(*d*) Glass is of poor quality when phenolphthalein is colored pink and methylene red is colored red.

When the procedure was applied to narcotine hydrochloride, the same result was arrived at as through the determination of the hydrogen ion.

After reviewing the main starting-points for the preparation of injection substances, the authors proceeded to the study of several representative substances: morphine, cocaine, adrenaline, apomorphine hydrochlorate; injection solutions of urethane quinine; artificial sera. These sera are usually sterilized in an autoclave at 120°, and the ampoules are of neutral glass, free from lead and calcium. All the substances entering into the composition of a serum must be chemically pure, and the distilled water employed for these solutions must be pure and distinctly neutral. The sterilization of oils for use in the preparation of injection substances may be carried out in an autoclave, in receptacles of neutral glass.

The principal solutions utilized in the Military Medical Service are: adrenaline hydrochlorate; apomorphine hydrochlorate; atropine sulphate; arrhenal; sodium bicarbonate; caffeine; calcium; glycerin phosphate; cocaine hydrochlorate; cocaine-adrenaline; codein phosphate; sodium cacodylate; sodium citrate; sulphuric ether; gelatin; glucose; camphorated oil; quinine iodobismuthate; potassium iodide; morphine; mercury, cyanide and biniodide; novocaine; novocaine-adrenaline; pilocarpine; quinine urethane; stovain; strychnine sulphate; strophanthin; sparteine sulphate; urotropin.

Conclusions

The employment of as pure active substances as possible is required in the preparation of injection solutions.

The excipients used—water, olive oil, etc.—must be pure and neutral.

The ampoules must be of neutral glass and must not yield an alkalinity exceeding 2 cubic centimeters centinormal solution, to 100 cubic centimeters of distilled water after sterilization in an autoclave.

In the preparation of solutions of morphine salts for injection, only ampoules of neutral glass are to be used, sterilized in boiling water at 80°, after the addition of 8–10 centigrams hydrochloric acid per liter.

Cocaine solutions prepared with neutral distilled water and put in ampoules of neutral glass may be sterilized by tyndallization, at 60° for half an hour, three times in succession.

The polarimeter can not be utilized for the investigation of the alteration of injection solutions of morphine and cocaine salts.

Novocaine solutions, prepared with distilled water saturated with benzoic acid, to which is added a solution of sodium bisulphate in a proportion of 3 cubic centimeters per liter, should be tyndallized for half an hour at 60° on three successive days, provided that only ampoules of neutral glass are used.

Stovain in neutral watery solutions is to be sterilized at 100° for half an hour.

Solution of adrenaline, hydrochlorate in water saturated with benzoic acid, containing a solution of 3 cubic centimeters sodium bisulphate and 7.5 per cent sodium chloride is to be sterilized in neutral glass by tyndallization at 60° for thirty minutes, three times in succession.

Injection solutions of strychnine sulphate may be sterilized even at 120°, on condition that only ampoules of neutral glass are used, as an alkaline medium precipitates the alkaloid.

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Sodium cacodylate and arrhenal tolerate sterilization in an autoclave at 110°–120° for half an hour, when these solutions are contained in neutral glass, free from lead and calcium.

Mercurial salts, especially the biniodide and the cyanide, may be sterilized at 130° for forty minutes, in absolutely neutral ampoules.

Injection solutions of potassium and sodium do not tolerate sterilization and must be tyndallized at 60° for half an hour, on three consecutive days.

Injection solutions of sodium bicarbonate, prepared with cold distilled water, may be sterilized for twenty minutes at 100°, in resistant and well-closed receptacles of neutral glass.

Artificial sera readily tolerate sterilization, on condition that ampoules of neutral glass, free from lead and calcium are used. The active substances in the preparation of these sera must be very pure.

Oily solutions for injection, prepared under aseptic conditions, should be sterilized by tyndallization.

Injection solutions of iodobismuthate of quininė may be sterilized for forty minutes at 120°.

COMMUNICATIONS

Saint-Sernin (France).

Chief Pharmacist Chemist, First Class, A. Saint-Sernin, French Navy, contributed a tabulation of twenty-one *Medicinal Ampoules in Use in the Medical Service in the French Navy*, with data on their mode of sterilization and the length of preservation, ranging from six months to three years. These medicinal agents are: adrenaline, arrhenal, atropine (sulphate), biniodide of mercury, caffeine, doubly distilled water, cacodylate of sodium, emetine (hydrochlorate), eserine (hydrochlorate), fluid extract of ergot, glycero-phosphate of sodium, camphorated oil, morphine (hydrochlorate), novocaine-adrenaline, quinine-urethane, stovain, strychnine, cyanide of mercury, cocaine (hydrochlorate), physiological serum (physiological salt solution), sparteine (sulphate).

Suzzi (Italy).

Contributions of the Italian Military Medical Service to the Technique of the Preparation and Preservation of Medicinal Agents for Hypodermic Use, was given by Chemical Pharmacist Colonel Dr. Filippo Suzzi (Italy), who briefly summarized the contributions

made for about thirty years by the Italian Military Medical Service, through its investigations, methods, and appliances, to the many problems of pharmaceutical technique, with respect to the preparation and preservation of medicinal agents for hypodermic use, with special reference to studies along the line of composition of the glass for the flasks.

Morreau and Raynaud (France).

The summary of the communication on *The Preparation and Preservation of Medicinal Ampoules in Use in the Medicinal Service of the Armies on Land and Sea*, by Pharmacist Colonel Morreau and Pharmacist Commandant Raynaud (France), is as follows:

In the manufacture of medicinal ampoules, the military pharmaceutic institutes must aim at furnishing irreproachable products at the lowest possible prices. For this purpose, industrial rules now in force must be adopted, namely, standardization of the material and quality of the ingredients, and employment of machines capable of a large output. The employees must be specialized and the distribution of the work must be arranged in the most rational manner. These rules are of general type and can not be disregarded if the army means to manufacture its ampoules at a competitive price with that of commercial products.

The empty flasks should be manufactured by the military establishment.

The preparation of the liquids for injection must be done under the best possible aseptic conditions. The solvents—water or oil—must be perfectly pure, and the same is true for the active principles.

Solutions for injection must often have a definite molecular concentration and ionic acidity. The solutions must be carefully freed from all substances in suspension.

Standardization is the most important point in the manufacture, and some investigations are still needed with respect to the sterilization of flasks filled with watery solutions modified by heat, such as sodium cacodylate or alkaloids.

The determination of the limit of preservation of the ampoules is also entitled to consideration. This limit is variable in all circumstances; it is governed by light reactions, by the small volume of air which remains in the closed ampoule, by the possible reaction of the glass on the substances in solution, and by the remote reactions which may take place between the constituents of the solution.

Gorreta (Italy).

Major Pharmacist Chemist Dr. Carlo Gorreta (Italy), gave the following résumé of his communication on *Preparation and Preservation of Medicinal Flasks in Use in the Auxiliary Service of the Armies and Navies:*

The preparation and unaltered preservation of flasks for hypodermic use are of special importance when such flasks serve for the auxiliary medical services. The twofold objective can be accomplished:

(*a*) By means of the employment of flasks made from absolutely neutral glass; and

(*b*) By the rational preparation, followed by appropriate sterilization, of the solutions. In the special case of medicinal flasks destined for use in the field services, therefore involving a prolonged preservation, a change of the flasks, at least three times a year, is advisable.

Thomann (Switzerland).

In the preparation and preservation of medicinal ampoules and fluids for injection, absolute sterility must be guaranteed, so far as possible, as stated in the communication of Colonel Thomann, Pharmacist in Chief of the Swiss Army. Sterilization involves the destruction of all germs, including the spores. The best guarantee for this is to be obtained by sterilization through steam under pressure, at a temperature of 115°–120° Centrigrade, for twenty minutes (autoclaves). As a large number of solutions for injection can not be heated to such a high temperature, one must remain satisfied with sterilization in streaming steam at 100° Centigrade, this temperature being tolerated by the principal medicinal solutions without danger of decomposition or alteration. For solutions which do not tolerate a temperature of 100° Centigrade, the method of tyndallization must be employed (heating on three successive days for one hour at 60°–70° Centigrade). These two last-mentioned methods are less reliable than sterilization in the autoclave and certain precautions have to be observed during the preparation of the flasks for injection, in order to obtain sterile solutions. It is, moreover, necessary to employ ampoules of neutral glass, in order to be able to preserve injection fluids without alteration.

The new Swiss Pharmacopeia gives very precise instructions as to the methods of sterilization and the quality of the glass and the ampoules to be utilized for the preparation and preservation of injection fluids.

With respect to the sterilization of urotropine solutions, 40 per cent solutions may readily be sterilized by streaming steam, while 10–20 per cent solutions tolerate only tyndallization. The method of sterilization in this case depends upon the concentration of the solution.

For the sterilization of glucose solutions, the data found in the literature are very divergent. On verifying these statements, the author found that an isotonic solution of glucose can be sterilized in an autoclave for twenty minutes at a temperature of 115° Centigrade. In studying the different methods of sterilization of the injection fluids, he was able to demonstrate that the statements made in the literature in this regard are not always accurate. Verification is recommended, before declaring a method as applicable.

THE SEQUELAE OF WAR WOUNDS OF THE TEETH AND INFERIOR MAXILLA: THEIR TREATMENT

OFFICIAL REPORTS

Wijnen (Netherlands).

The first half of the Netherland official report on *The After-effects and Treatment of War Injuries of the Teeth and Lower Jaw*, was taken up by Dr. H. P. Wijnen (Netherlands). Wounds of the jaw occurred so frequently during the World War, and their immediate treatment by specialists was found so necessary, that special hospitals had to be equipped for the exclusive treatment of such cases.

The subject was discussed by the author under the following headings: The effect of the projectile on the soft parts and on the bony framework of the lower jaw; first aid, and treatment of dangerous complications; the question of immediate suture of the soft parts in the presence of wounds of the lower jaw; immediate surgical treatment of wounds of the mandible; anesthetics; injuries to the salivary glands; injuries of the facial nerves and methods of treatment; the treatment of indrawn scars; pseudarthroses after wounds of the lower jaw; the treatment of pseudarthroses; the right moment for bone transplantation; free bone grafting; the operative preparation of the defect; the procuring of free bone graft; the insertion of the graft; the dressing; large and compound defects; defects in the vertical portion of the lower jaw; replacement of the vertical portion; ankylosis of the joints of the lower jaw; disturbances of wound repair and the results of graftings; fractures of the tibia after excision of the graft; plastic operations with pedicled bone grafts.

Experience has taught that grafting is most successful when the graft, together with the periosteum, is transplanted at body temperature. Provision must be made in the depth of the wound for the proper nutrition of the graft, and it is needless to say that the asepsis must be absolutely reliable. The fact is repeatedly emphasized by the author that success depends primarily on absolute immobilization.

Defects in the lower jaw can be repaired either by free bone grafting or by a compound flap. The operation of free bone grafting comprises:

(*a*) Operative preparation of the defect for the reception of the graft;
(*b*) Excision of the graft;
(*c*) Grafting of the shaped bone segment in the gap of the mandible.

For large defects, where for instance, half of the lower jaw is missing, a rib or the iliac crest is generally utilized. In many cases, only part of the defect is dealt with at first and, after some weeks, the remaining gap is bridged over with a bone graft. It is a mistake to fix the graft with wires or other foreign bodies. Drainage and tamponing should, likewise, be omitted.

Conclusions

Summarizing, the following conclusions may be drawn:

(1) For the treatment of gunshot wounds of the lower jaw, constant cooperation between surgeon and dentist is essential.

(2) In view of the frequency of injuries of the lower jaw, it is desirable for separate centers to be equipped for the treatment of these cases.

(3) Fractures of the lower jaw generally communicate with the mouth cavity and, consequently, infection of the fracture frequently arises. In these cases, primary osteosynthesis should not be performed.

(4) Fragments of the lower jaw have a tendency to shift towards the mouth, and it is, therefore, a mistake to apply a tight external provisional dressing, as this may cause increased displacement.

(5) After the emergency immobilization of the fragments has been completed by the dentist, the danger of suffocation must be efficiently eliminated.

(6) The wound is cleansed by washing it with physiological saline solution or with a solution of hydrogen dioxide, after which the wound is loosely tamponed; open wound treatment is subsequently applied, with ointment dressings, if necessary.

(7) Extensive wounds should not be primarily closed.

(8) Radical operation with bone transplantation is considered the best treatment for pseudarthroses.

In general, face wounds heal well. The tissues are rich in blood and there are relatively few muscles and little fat. Primary excision of the tissues is seldom necessary, especially as tetanus and gas phlegmon hardly ever occur in such wounds. Small wounds in the soft parts need not be sutured. Experience has taught that the best time to perform suture in more extensive wounds is between the tenth and the twentieth day after the injury.

Witthaus (Netherlands).

Dental Surgical Assistance in Cases of Wounds of the Lower Jaw, by C. H. Witthaus, Doctor of Dental Surgery, constituted the second half of the Netherland official report.

The prognosis of mandibular wounds naturally depends on the nature and extent of the injury; with proper treatment, it is relatively favorable. With respect to the very essential replacement and fixation of the broken fragments, dental surgeons have made use of the teeth, firmly fixed in bone sockets, for dental orthopedic purposes, and strong dental appliances are used at the present day for reducing jaw fractures. In this way, a firm fixation of the broken fragments is obtained, speech and swallowing are not impeded, cleaning and disinfection of the mouth and teeth are possible. The mechanical accessories used with metal jaw splints are naturally most variegated, according to the requirements of each case.

In order to bridge over a defect in the body of the mandible by a bone graft, the two fractured ends must first be firmly immobilized; this can be done with a strong metal splint. Carious or broken teeth, with root infections, would prevent the wounds from healing, in consequence of continual infection and, therefore, if their roots can not be disinfected, the teeth must be extracted.

When, as a result of injury, the inferior alveolar artery is destroyed in front of or in the jaw channel, and the condition can not be remedied by a collateral arterial supply, the blood ceases to nourish the teeth in the center of the lesion and the dental pulps become necrotic. As a consequence, suppuration or gangrene of the pulps sets in, with infection of the periapical bone tissue, which may eventually lead to infection of the wound. This should be guarded against, by extirpation of necrotic pulps after trepanation of the crown, and adequate filling of the root canal.

An exceptionally strong support, if required, can be made by the dental surgeon, by modeling a head cap with a wire frame and plaster of Paris bandages. Such a head cap can also be provided with a

bridle extending to the chin, where it can give strong support to the fractured middle portion of the lower jaw, or if the corpus mandibulae is missing, to the tongue, and thus be a safeguard against suffocation.

The diagnosis in cases of mandibular wounds and fractures is not difficult, as the dislocation, the mobility of the broken fragments, and the crepitation leave no room for doubt; but for adequate treatment, a closer investigation of the situation by means of one or more Roentgenograms is essential. The author succeeded in obtaining very distinct photos of the frontal area, as far as the premolars, by placing a plate, 7 to 8 centimeters square, in the mouth, on the lower teeth arch, and making exposures from the neck with the head in a hanging position. A very clear survey of the injury is also obtained with stereoscopic photos, which are especially of value where a foreign body has to be sought or is localized in the tissue, and where a very comprehensive survey of the local condition is essential with a view to bone plastics.

Conclusions

(1) In wounds of the lower jaw, fixation of the broken ends by bandages around the chin and head, or by bone suture, almost invariably gives unsatisfactory results.

(2) The reduction of a fractured lower jaw should be effected by means of a wire bandage attached to the teeth, constructed and fitted by a dental surgeon in accordance with regulations.

(3) As soon as possible after the infliction of the injury, the dentist or surgeon must endeavor to reduce the fracture of the lower jaw provisionally, by means of a wire bandage (Sauer's emergency dressing), and if the middle portion of the jaw is broken off, it should be drawn forward, supported, and held in place.

(4) In order to insure proper treatment of wounds of the inferior maxilla, it is absolutely necessary for the wounded to be transported, as soon as possible, to a specially equipped hospital where the assistance of dental surgeons is available (maxillary wounds station).

The general question of *The Sequelae of War Wounds of the Teeth and Inferior Maxilla: Their Treatment* was divided into three parts by Poland:

(1) First Aid to Maxillary Casualties at the Front;
(2) Treatment of War Wounds of the Lower Jaw;
(3) Sequelae of War Wounds of the Lower Jaw and Teeth, and their Treatment in the Light of Modern Surgery.

Mieszkis (Poland).

Lieutenant Colonel Surgeon Dentist S. Mieszkis, Chief of the Stomatological Service of the Center of Medical Instruction of the Army (Poland), in his contribution on *First Aid to Maxillary Casualties at the Front*, stated that the World War furnished a very large number of jaw injuries, and that treatment of such wounds has since made enormous progress.

Nearly all countries which were engaged in the war organized special hospitals for maxillary injuries, the necessity for which is no longer questioned. Such hospitals can be organized only in the interior of the country, at a distance from the battlefield, in a calm, quiet atmosphere, as the treatment of these wounds requires special installations and must provide for a long, uninterrupted therapy.

Experience in the World War brought to light a great defect in the treatment of jaw casualties, namely, the absence of an adequate first-aid organization at the front. The washing of a wound, the suture of the torn and lacerated soft parts, and the preliminary dressings are not sufficient first aid for maxillary injuries. In many cases, suture of the external injuries of the cheek and the chin interferes with the course of treatment and does not in any way assist a definite cure. In a large number of cases, it was necessary to perform, in maxillary casualties which had been sent in late and without special first-aid treatment, several rather serious surgical interventions, in order to be enabled to proceed to orthodontic operations proper. Needless suffering of these wounded and waste of time of the operators can be avoided by giving these casualties the first special aid at the front, in the field hospital.

Granted that in field hospitals, major installations of dental surgery and appropriate technical provisions are out of the question, the first-aid treatment for maxillary casualties must be organized in a simpler fashion. The appliances for immobilization of the fragments of maxillary bones must comply with the following rules:

(1) They must be easily constructed and applied.
(2) They must not require complicated technical apparatus.
(3) They must not need metal soldering.
(4) They must be constructed instantaneously, as the wounded can not be kept for a long time in a field hospital.
(5) They may not extend beyond the mouth cavity, for the transportation of such casualties would prove extremely difficult.

A number of listed models of appliances, in spite of their great value, do not meet the requirements for first aid to maxillary casual-

ties in the field hospital. However, it does not seem necessary to look for other plans or to elaborate other models of maxillary appliances, as the entire problem has been thoroughly studied by Surgeon Dentist S. Tigerschted, of Finland. His book, *The Military System of Surgical and Orthodontic Treatment in the Field of Gunshot Wounds of the Jaws*, published during the war and based on a very wide experience, contains everything of interest in this connection. His system is very fully explained by him, not all of it being applicable in the field. Certain data, however, are indispensable at the front, and all military surgeon dentists may make their own modifications in a given case. The great advantage of the Tigerschted system is that most of the accessories, and even most of the appliances themselves, can be found in the mobilization stocks of all armies, in a nearly finished state. It is only necessary to adjust and fit such an appliance to the wounded man. This is done very easily and does not take much of the valuable time during a period of important engagements. Tigerschted fixes his appliances in the buccal cavity with the assistance of " fixation needles ", which are then capped with small aluminum tips, for the protection of the mucous membranes, and which serve for the attachment of elastic bands, drawing the fragments of the fractured jaw in the desired direction. In cases of complicated fractures, where the fractured ends have a marked tendency to separate, the ordinary appliances can be completed and strengthened by encircling the teeth not only on the extensor side, but also on the side of the tongue.

The best material for field appliances is aluminum wire, two millimeters in diameter, except for retention appliances, where the tendency of the fragments of the jaw to slip is very pronounced. In these cases, a stronger wire is required. The fixation needles, which must be very smooth and well polished, are made of copper, 0.75 millimeters in diameter, and must be about five centimeters in length; the tapering of the needle must begin at one third of its length.

The foregoing constitutes merely an outline of the first care of casualties with injuries of the lower jaw. Repeated emphasis is placed on the necessity for organization of first-aid instruction for maxillary casualties at the front, in those armies where this has not yet been done, and for the provision of field appliances, with their accessories, for the inferior maxilla, in the mobilization stores of the medical material.

Wilga (Poland).

The second part of Poland's official report, *The Treatment of War Wounds of the Lower Jaw*, was taken up by Professor H. Wilga,

Medical Director of the Stomatological Clinic of the State Stomatological Institute in Warsaw, who based his contribution on his personal experience acquired during the World War, in over 25,000 cases treated in the Hospital for Maxillary Injuries, of which he was chief surgeon.

The characteristics of gunshot wounds of the lower jaw are very diverse and depend upon the kind of weapon by which they are caused—bullet, shell splinter, bomb—as well as upon the distance from which the projectile has come. The destructive force is greater in proportion to the shorter distance from which the projectile has traveled. A shell splinter or bullet, fired from near by, may tear away the entire jaw or its larger portion, with the surrounding soft parts.

War wounds of the lower jaw may be complicated by hemorrhage (from the carotid, maxillary, or lingual artery), depression of the tongue, difficulty of deglutition, phlegmon, osteomyelitis, or other complications. War wounds of the upper and lower jaw present different characteristics and must be studied separately.

Characteristics of gunshot wounds of the lower jaw: The lower jaw has not much spongy osseous tissue, being composed especially of compact bony layers, so that it is very hard and is much more seriously damaged by projectiles, than other bones. Gunshot wounds of the lower jaw, inflicted by a modern projectile of small caliber, may be divided into:

(*a*) Fractures with large osseous fragments, when the projectile has come from a distance of 1,000 feet or more; and

(*b*) Fractures with small osseous fragments, with a more or less considerable destruction of the osseous tissue, when the projectile has come from a distance of 200–400 feet. The destruction of osseous tissue at the exit orifice of the projectile is greater than at the entrance orifice.

Fractures of the lower jaw through war projectiles may occur at two, three, or more points at once. They are accompanied by a displacement of the osseous fragments. This displacement at first induces tonic contraction and, subsequently, the dislocation of the fragments becomes aggravated and confirmed, through formation of scar tissue. The destruction of osseous tissue of the lower jaw is accompanied by collapse of the soft parts of the cheek.

The most frequently observed war fractures of the lower jaw are the following:

(1) Fracture of the middle line of the chin, between the central incisors, with approximation of the fragments towards the middle. When the fracture diverges from the middle line, besides displacement of the two fragments towards the middle, the smallest fragment becomes displaced upwards above the line of articulation of the teeth.

(2) Unilateral fracture in the region of the premolars or the molars, and beyond the latter. The osseous fragments are displaced towards the middle line, the largest fragment, at the same time, becoming displaced backwards and the smallest very often upwards.

(3) Bilateral fracture in the neighborhood of the premolars and the molars, as well as beyond the line of the latter. The jaw becomes displaced backwards and downwards.

(4) Unilateral fracture of the ascending ramus of the lower jaw above the points of insertion of the masseters. The displacement of the lower jaw takes place towards the side opposite the fracture.

(5) Fracture of the two ascending rami of the lower jaw above the points of insertion of the masseters. Forward displacement of the jaw.

(6) Fractures of the lower jaw at several points. The direction of the displacement of the osseous fragments depends upon the action of the different muscular groups, as well as on the subsequent formation of powerful cicatricial contractures.

The more than 25,000 cases of fractures of the lower jaw contracted in the World War and treated in the special Hospital for Maxillary Injuries, were grouped as follows:

	Per cent
Unilateral fractures of the body of the lower jaw	36.2
Fractures with a loss of a portion of the bone	24.5
Bilateral fractures of the body of the lower jaw	10.8
Fractures of the angle of the lower jaw	6.6
Central fractures (in the middle line of the lower jaw)	6.1
Unilateral fractures of the ascending ramus of the lower jaw	4.9
Bilateral fractures of the ascending ramus of the lower jaw	0.9
Fractures of the two angles of the lower jaw	0.4
Multiple fractures	10.1

The treatment of gunshot fractures of the lower jaw consists of:

(1) General surgical treatment of the wound;
(2) Special treatment;
(3) Plastic operations, when considered necessary.

The purpose of the general surgical treatment of the wound is to create favorable conditions to permit the best course of healing and repair. It is necessary to keep in mind the extraordinary regenerative power of the mandible. It is not advisable to remove even very small bony fragments, because it is very difficult to decide which of these will become consolidated and which are doomed to necrosis. Furthermore, experience has shown that even osseous fragments which have lost their vitality, play the part of a stimulating factor in the process of regeneration of new bone, through the remaining portions of the periosteum.

Open infected wounds of the soft parts heal better and more rapidly, so that early suture should be omitted.

A considerable displacement of the osseous fragments of the lower jaw may interfere with respiration and deglutition. This disturbance, with a few exceptions, usually ceases as soon as the osseous fragments have been replaced in position and are maintained there by a suitable appliance. Wire sutures of the mandible should be omitted, even in the case of uncomplicated fractures, because the associated destruction of a portion of the osseous tissue induces a shortening of the dental border of the lower jaw and an irregular articulation of the teeth, which will subsequently interfere with the function of mastication. Fixation of fragments of the lower jaw by means of intermediate introduction of metal appliances is likewise contra-indicated, as they might cause necrosis of the extremities of these fragments. Only fragments of a lower jaw without teeth may be sutured with the assistance of an appropriate appliance, for in this case there is no other means of fixation to hold them in place. The implantation of an ivory plate, as well as early bone grafts, yield no better results, on account of the greater infection of the buccal cavity at this time.

The best moment for the application of a bone graft is at the end of several months, after the elimination of sequestra is completely terminated and when all danger of infection, either of the wound or cicatrix, is past. After the application of a bone graft, all action of the muscles on the grafted bone fragment must be entirely prevented by means of a suitable contrivance.

Plastic operations on the soft parts can be performed only after the special treatment is completely terminated, and the patient's dental prosthesis has been fitted. The results of plastic operations on the soft parts are more satisfactory after the cicatrices are thoroughly massaged and made supple.

The special treatment of fractures of the lower jaw aims at:

(1) Reduction of the dislocation of the mandibular fragments by replacing them so as to obtain a normal dental articulation, with—

(2) Maintenance of the bony fragments by means of a suitable appliance.

In early cases, the two operations are performed at the same time: the surgeon reduces the fracture and fixes the fragments by means of the selected appliance. In old neglected fractures, the first operation, namely, the restoration of the fragments of the lower jaw, is accomplished by means of a sometimes very lengthy and complicated extension (stretching), followed by fixation of the reduced fragments.

In the treatment of gunshot wounds of the lower jaw, it is more than ordinarily necessary to treat each case individually. Every war fracture of the lower jaw, with respect to its treatment, presents a special problem, so that there is no model treatment and there are no standardized appliances.

The special treatment is conducted, from start to finish, by keeping in mind the rule that the lower jaw must always retain the freedom of its movements. The appliances utilized in the course of the treatment are fixed on the teeth and must not irritate the gums. They must be sufficiently strong, so as to maintain the fragments of the jaw in a state of complete rest and must counteract, first, the muscular contractions and next, the powerful contraction of the scar tissue, which promptly develops and has a tendency to displace the osseous fragments of the mandible.

Meissner (Poland).

The Sequelae of War Wounds of the Lower Jaw and Teeth, and Their Treatment in the Light of Modern Surgery, the final section of Poland's official report, was submitted by Dr. Meissner, Professor in the Warsaw Stomatological Institute.

The inferior maxilla occupies a highly important place among the bones of the human body. The lower jaw is the foundation of the function of mastication, so that from the viewpoint of human life,

it accomplishes a most important and indispensable act. The lower jaw, likewise, represents a portion of the face and, to a high degree, contributes to its appearance. The slightest deformity of the lower jaw causes great changes of the face, and interference with its esthetic configuration can often decide the patient's future. It is, therefore, readily understood that the inferior maxilla is a constant object of study as to any pathological conditions and their treatment. In studying the lesions of the lower jaw, attention is directed especially to the disturbances of mastication and to its restoration. Such disturbances occur in the case of extensive osseous lesions caused through inflammatory processes, as well as in the case of neoplasm or traumatic lesions of any kind, in this region.

War injuries differ from other traumatic lesions of the mandible in several ways. A special feature distinguishes them from traumatisms of the lower jaw caused, for example, by the kick of a horse, by machinery, or in common automobile accidents, where the surgeon is confronted with more or less typical fractures of a single area or several areas, and where the soft parts are lacerated to a fairly considerable extent. War injuries are always accompanied by loss or destruction of bony tissue; the soft parts, at the same time, are damaged to a variable degree. The entrance orifice of the bullet may be barely visible and the exit orifice may be disproportionately larger. In some cases, according to the nature of the projectile, the soft parts may be detached to a great extent, while the bone is barely touched but is extensively denuded and exposed. Sometimes the soft parts, as well as the maxilla, may be so severely damaged or even completely torn away, that the floor of the pharynx is seen, through a large gaping hole, in the frightfully disfigured face of the wounded.

War lesions of the mandible alone are characterized by contusion of the bone, with irregular fracture lines radiating in all directions. The soft parts may be displaced with the bony fragments. Briefly, a contused and crushed mandible is the characteristic picture of gunshot wounds of the inferior maxilla. The teeth may be damaged in two fashions—luxated or broken. In the case of luxations, the tooth may be entirely lost or merely displaced from the side of the fractured alveolar process. The fracture of a tooth may involve its crown alone, with its neck or its root. The fracture line at the end of the root may pass to the neighborhood of the neck of the tooth, near its center or summit.

The surgical treatment of war lesions of the lower jaw may be divided into two distinct periods:

(1) The most rapid possible cicatrization of the wound;
(2) The reconstruction of the jaw, after cicatrization.

The first period begins at the moment of first aid and consists in the creation of conditions favorable to cicatrization of the wound, in conformity with the rules of modern surgery. Attention should be directed to the treatment of the surrounding soft parts, as well as the osseous tissue of the jaw. In this treatment it is necessary to follow the rule of the greatest saving of even very badly damaged tissues. The smallest shreds which it is possible to save must be preserved. Sometimes small bony splinters are seen in the wound; when these are lined with periosteum and retain their vitality, they may render inestimable service.

It is best to try to bring the soft parts together by means of sutures and to cover the bony portions. When this is impossible, gauze is utilized (preferably iodoform gauze) and an attempt made to maintain the bony fragments in position, by some contrivance or other—the simplest possible. A wire attached to the remaining teeth, held fast at different points of the jaw, is often sufficient. A very simple procedure, employed in the Stomatological Clinic of the Warsaw State Stomatological Institute, consists in encircling the teeth by means of a silk thread loop and tying the threads together with knots.

Difficulties are apt to arise in the first period of treatment of war fractures of the lower jaw, when there are accompanying lesions of the teeth; notably when they are broken or the dental pulp is exposed. In such instances, the teeth may be painful, but their extraction is not indicated. The value of even a dental root is now understood and appreciated, and an attempt is made to utilize all means for the relief of pain before resorting to extraction. Definite treatment of the teeth and detailed examination of dental conditions must be attended to later on, when it is possible to recognize the exact articulation of the teeth and when the importance of each one in every individual case can be appreciated.

During the first period of surgical treatment of inferior maxillary lesions, attention is directed along two lines:

(1) The interrelation of the bony fragments of the lower jaw;
(2) The prevention of the various complications of this period.

In three or four weeks, osseous callus begins to form and to bind the different fragments of the jaw. At this time, the consolidation is usually fibrous and yields to continuous extension, which can be

applied by means of the customary adjuvants. Care must be taken to prevent the complications which may arise during cicatrization of the wound. It is true that, by this time, the surface of the wound is covered with granulations, which oppose infection; nevertheless, some osseous fragments which become necrotic and induce infiltration of the soft tissues may lead to prolonged suppuration. The inspection of the wounds from time to time is, therefore, required.

In the case of formation of phlegmons, either on the floor of the buccal cavity or in the submaxillary or perimaxillary spaces, provision must be made for the escape of the pus to the exterior. Observations made in the State Stomatological Clinic in Warsaw showed that the mode of surgical intervention best adapted to the patient in all cases of phlegmons, in the region of the lower jaw, is an operation through the buccal route, where, after incision of the mucosa on the lingual or buccal side and along the mandible, the surgeon, by simple trimming and loosening of the cellular tissues, reaches the pus focus and drains it by means of a rubber tube.

In all cases where there is a more or less considerable loss of osseous tissue as a sequel of maxillary fracture, the important problem of repairing the conditions of dental articulation arises. As the application of dental prostheses does not furnish satisfactory means for normal mastication, because of the absence of a base, which the movable stumps of the jaw can not furnish, surgical intervention is necessary. Wide experience in this field was gained in the World War and the years succeeding it, with improvement of the earlier surgical procedures. All realize this in common, that while accepting the leading discoveries of plastic osseous surgery, they involve difficult and complicated measures. The method of Spanier consists in immobilizing the stumps of the jaw in their proper place for a rather prolonged period of time, and not filling the loss of osseous tissue of the mandible. This method is especially entitled to consideration because it is necessary to reckon with the possibility of regeneration of new bone through the remaining portions of the periosteum. The best measure for fixation of the displaced osseous fragments, at the present state of dental surgery, seems to consist in subperiosteal immobilization.

In order to cover the loss of tissue of the lower jaw, several methods of transplantation (grafts) may be utilized:

(1) Transplantation of pedunculated fragments, borrowed from parts in the immediate neighborhood of the lower jaw.

(2) So-called free transplantation of remote bones, such as the tibia, the ilium, the ribs. These free grafts are applied in two

ways: first, the fragments to which the displaced bone is to be attached are immobilized (Axhausen); second, movable stumps are used; this is the method of Billington and Round.

Osseous grafts in the lower jaw involve difficulties, not only from the viewpoint of securing the graft, but because they often give unsatisfactory results in regard to the reconstruction of normal articulation of the teeth. Osseous fragments which for a time after transplantation are in good position, subsequently become more or less displaced. The slightest displacement causes changes in the articulation of the teeth. It is difficult to subject the patient to new surgical interventions when this occurs. In such cases, a properly selected fragment of the upper jaw is adapted to the conditions of the mandible. For this purpose, the alveolo-dental process is excised on all sides from the body of the upper jaw under the periosteum, and is displaced, together with the teeth, to the side towards which the lower jaw has become dislocated. After this operation, the masticating surfaces are in contact and the occlusion of the teeth becomes normal. In several such cases this procedure was successful.

A wide field is open to the modern surgeon, when he plans to replace the loss of the soft parts in war wounds of the lower jaw. General rules may be followed for the necessary interventions. Transplantations of the soft parts are required when, as the result of a lesion, there is an extensive loss of tissue and the function of the mandible, namely, mastication and opening of the mouth, is interfered with through the formation of cicatricial contractions. In these cases, excision of the cicatrices, preparation of the healthy portions and their junction by a borrowed flap, if necessary, will give the best results (Ertl). In the majority of cases, this method will provide good results. It will be necessary to resort to the transplantation of fat (preferably from the integument of the abdominal wall) or to the employment of paraffin (procedure of Stein), only in the case of a very extensive loss of soft parts.

In the treatment of damaged teeth, the rule should be followed of preserving all that can be saved. Teeth which have been entirely lost should be replaced, after suitable preparation, in their corresponding alveoli. Favorable results have been obtained in preserving broken teeth. Undoubtedly, after fracture of the dental crown, the root may serve as a support for a gold crown. In longitudinal fractures of the root, the attempt at its preservation unfortunately does not yield good results. In the case of oblique fractures, the tooth can be saved—even if the fracture line on one side is prolonged

rather far under the gums—by adjusting a gold crown on the supporting root. In transverse fractures of the root, personal experience has shown the following results: when the upper part of the root was fractured, reconstruction of the tooth, although difficult, was possible. Fracture of the middle portion of the root yielded good results only in those cases where the pulp had retained its vitality. On the other hand, such a tooth could not be preserved when the pulp had undergone necrosis. In these circumstances, there was danger of the gangrene of the pulp spreading the infection, and it was advisable to remove the tooth. Fractures of the root near the summit gave good results; when the pulp retained its vitality, the fragments united and the tooth remained unchanged. When the pulp is necrotic, the canal must be cleaned as far as the fractured portion, with resection of the small portion near the summit of the root.

Briefly, it may be concluded that the disastrous results of war lesions of the lower jaw can be repaired through modern surgical measures.

Conclusions of Poland's Combined Report

(1) The effects of war wounds of the jaws are so grave as to require special treatment.

(2) This treatment can be more successfully carried out in the interior of the country, as it requires much time, experienced specialists, a qualified auxiliary personnel, and hospitals specially organized for this purpose, with their surgical, dental,. and prosthetic services.

(3) The treatment of maxillary casualties should be carried out in specially organized hospitals. The wounded at the front can be given only first aid.

(4) Maxillary casualties, as promptly as possible, after receiving first aid at the front, should be evacuated to a special hospital in the interior, for their treatment will prove more efficient if applied without loss of time.

(5) It is necessary in peace time to train a sufficient number of specialists to render first aid to maxillary casualties at the front, and to treat war wounds of the jaws, in order to have teams ready to organize in war time a sufficient number of special hospitals for such cases.

(6) It is necessary to have a sufficient number of splints and appliances in the mobilization stores to be used for first aid in cases with maxillary wounds.

(7) In view of the fact that the osseous tissue of the maxilla is characterized by a high degree of vitality and capacity for regeneration, it is necessary to guard against premature removal of even the smallest osseous fragments.

(8) Similar attempts should be made to preserve cracked, luxated, or broken teeth, for these can often be saved by fitting them with a crown or dental prosthesis.

(9) In rendering first aid at the front, it is not advisable to resort to plastic operations on the soft parts of the jaws, for the grafts are likely to become necrotic; this would seriously interfere with the ultimate treatment in the special hospital and lead to a less satisfactory definite outcome.

(10) In the treatment of war wounds of the mandible, it is necessary, primarily, to keep in mind the function of mastication; it is, therefore, important to begin with the reduction of the fracture, in order to secure normal articulation of the teeth, and then to proceed to plastic operations on the soft parts, in order to improve the esthetic appearance of the patient.

(11) Reconstructive surgery of the face, in the form of plastic facial operations, must never be neglected, as the esthetic appearance of the ex-service man often determines his aptitude for a gainful occupation and affects his entire future.

COMMUNICATIONS

Bercher (France).

Lieutenant Colonel J. H. Bercher, Surgeon to the Military Hospital of the Val-de-Grâce (France), presented a communication on *The Sequelae of War Traumatisms of the Mandible and the Teeth: Their Treatment.*

The sequelae of war traumatisms of the lower portion of the face may affect the soft parts, the teeth, and the bones. Eventual infection at the site of the fracture terminates in chronic or recurrent osteitis. Retarded consolidation, nonconsolidation, pseudarthrosis are caused either by infection or through a rather extensive loss of osseous substance due to the traumatism itself, or to a hasty surgical intervention (removal of bone splinters). Pseudarthroses constitute a very grave infirmity; when somewhat extensive and loose, they do not permit the application of apparatus and they interfere with all normal mastication. The treatment is surgical, and the intervention is successful only when there is no further infection of the fracture

focus and after a perfect immobilization of the fragments has been secured, by means of bimaxillary fixation.

In a general way, sequelae of traumatisms of the mandible differ from those of the other bones only by the special function of the lower jaw; but there are a few very particular sequelae without counterpart in the remainder of the skeleton. In the first place, maxillary injuries may react on the teeth. In the course of mandibular wounds, the dental nerves and artery may be divided in the dental canal. A loss of substance of the premaxillary soft parts—cheeks and tongue—may induce malposition of the teeth, endangering their solidity and survival. Second, sequelae of maxillary traumatisms may also be seen in the temporomaxillary articulation. Third, nervous affections may follow upon maxillary injuries, such as facial neuritis and neuralgia. Finally, these wounds are serious not only through impairment of mastication and thereby of nutrition, but because of the unfavorable reaction on the psychic condition of the patient.

Filderman (France).

In his communication on the *Sequelae of Traumatisms of the Mandible and the Teeth*, J. Filderman, Military Dentist, First Class (Reserve), President of the " Fédération Nationale des Amicales des Dentistes des Armées de Terre et de Mer " (France), restricted himself to emphasizing the importance of the conclusions of the Polish report, more particularly the necessity for educating specialists during peace, in the treatment of maxillo-dental injuries. In daily practice, there is rarely an occasion for this kind of work. Although automobile accidents often cause grave injuries of the face, these wounds are more apt to concern the upper than the lower jaw, and are especially characterized by horizontal fractures of the superior maxilla. But these accidents are not common enough to permit all dentists to acquire a sufficient experience. For this purpose, the " Fédération Amicale " of Dentists of the Army and Navy organized in Paris periodical conferences on these important questions. A number of qualified contributors have lent their valuable cooperation and assistance, and their contributions have been published in the *Dentiste Militaire.* So far, however, these conferences have presented only an especially theoretical interest. It is hoped that, in future, the advanced training of military dentists will be organized in a practical fashion, so as to enable them to work in an efficient manner in case of war and reduce to a minimum the sequelae of traumatisms of the jaws and the teeth.

Budin (France).

Military Dentist, First Class, Dr. Pierre Budin (France), President of the "Fédération Amicale" of Dentists of the Armies on Land and Sea, in the Region of Paris, added a single, very instructive clinical observation, with his conclusions and inquiries, to the preceding communications: A young artillery officer, pupil of the Central School, was wounded at the end of 1917 by a shell splinter, causing the total loss of the upper maxillaries and a fracture of the nasal bones. Under treatment by Professor Morestin, the patient had various plastic operations, fourteen in all, for reconstruction of the nose and the upper lip. The general condition of this patient, a vigorous man with a good constitution, is favorable at the present time; he has terminated his studies in the Central School, has never had any grave illness since he was wounded, and does not suffer from psychic disturbances. Although mastication and insalivation of the food are absolutely zero, he nourishes himself in a normal manner, without a special dietetic régime and without dyspeptic disturbances. On the other hand, his respiration is entirely buccal and he has become a mouth-breather. His occupation is agricultural and he lives out-of-doors, even in midwinter, without ever suffering from respiratory disturbances. As to the dental sequelae, this patient presents a premature senility of the teeth of the lower jaw. This condition is met with in all war casualties where a damaged maxilla has not been treated with prostheses and the surviving teeth have been left without antagonists. To a more or less marked degree, the condition is encountered in all cases where the articulation has not been correctly restored. In the foregoing case, there are no sequelae of a general type in evidence at the termination of fourteen years.

The author put forth many questions of interest: What has become of the bony or cartilaginous grafts; what has been the fate of metallic osteosyntheses? What has been the behavior of pseudarthroses in the course of time? What is the percentage of those who have adapted themselves, from the general viewpoint? What is the percentage of deaths, and the direct or remote cause of death? Finally, what are all the complications which have supervened during the years, and the treatments which were applied to these complications?

Butoïanu, Stoiovici, Stoian, and Theodorescu (Rumania).

Médecin-Général Professor Dr. M. Butoïanu, Inspector General, Service de Santé, Médecin-Colonel Dr. Stoiovici, Médecin-Lieutenant-

Colonel C. Stoian, and Médecin-Capitaine Dr. Dan Theodorescu, Assistant at Hôpital Central (Rumania), rendered a joint communication on *The Sequelae of War Traumatisms of the Teeth and the Mandible.*

The variety and gravity of war traumatisms of the teeth and lower jaw, as well as the high invalidity percentage of these casualties, invest them with a special importance. The evolution of such sequelae has been found to be directly related to the utilized therapy, and the results have been better, according to the organization of the surgical centers where they were treated.

On the basis of an analysis of these sequelae in 262 Rumanian war invalids, the following classification has been made:

A. Local sequelae	Per cent
(1) Dental sequelae	14.5
(2) Osteitis and osteomyelitis	16.0
(3) Nervous lesions and disturbances	2.5
(4) Vascular lesions (1 case)	
(5) Pseudarthroses	19.0
(6) Constriction of the jaw	12.0

A. Local sequelae—Con.	Per cent
(7) Faulty consolidation	22.5
(8) Osteomas (2 cases)	
(9) Salivary fistulas	2.0
(10) Buccal incontinence	6.0
B. General sequelae	
(1) Anemia.	
(2) Progressive cachexia.	
(3) Dyspepsias.	

The dental sequelae which are represented by a percentage of 14.5 per cent, vary in gravity up to total loss of teeth, with serious dyspeptic disturbances. The invalidity claim in these cases ranged between 20 to 40 per cent. In cases with loss of over one half of the teeth, prosthetic appliances were adjusted, with good results in the majority of the patients. Infectious lesions, such as osteitis and osteomyelitis, due to the presence of old foci of infection with sequestra (teeth or bones), were found in 16 per cent of the cases. Fistulas were encountered in 10 per cent. Pathological fractures, resulting from these lesions, were observed in six cases. The percentage of nervous lesions and disturbances amount to 2.5 per cent and occurred in the form of neuralgias of dental character, first intermittent and then continuous; paresis and paralysis in the domain of the facial nerve; tics and intermittent, sometimes very painful, contractions of the muscles of the face.

Traumatic lesions of the lower jaw may become complicated by vascular lesions, especially in the form of aneurysms. The most frequent sequelae are pseudarthroses, which were found in 19 per

cent of the cases, due to a loss of bony substance or to the elimination of sequestra. These pseudarthroses, aside from the deformity of the face, cause, at times, very serious disturbances of mastication and phonation. As a rule, the invalids express great dissatisfaction with their dento-maxillary prosthetic appliances. From the viewpoint of surgical treatment, in these cases, osteosynthesis yielded variable results. It can be employed only in simple, noninfected fractures, which are rare in war traumatisms.

It was possible for the authors to follow up one of two cases of bone grafting which they had treated. In this patient, a graft from the iliac crest had been transplanted in 1919; at the end of ten years, the pseudarthrosis persisted but the cosmetic and even the functional result was good. Only a portion of the horizontal ramus was missing. A rubber prosthesis replaced the lower border of the maxilla on the right side.

Buccal incontinence is a distressing infirmity, which was observed in 6 per cent of the cases. This sequel has very accurate therapeutic indications. The authors intervened in these cases by applying the rules of Nelaton and Ombredanne.

Conclusions

(1) The results of war traumatisms of the mandible and the teeth have been found to be directly related to the treatment which was employed.

(2) Such treatment must be carried out by the surgeon in collaboration with the specialists (stomatologist and dentist).

(3) Material for first-aid treatment of maxillo-facial lesions must be provided for during peace.

(4) Dental lesions must be treated immediately by specialists.

(5) Infectious lesions, such as osteitis, due to the presence of foreign bodies, teeth or sequestra, should be treated by surgical removal of these factors of chronic infection.

(6) Nervous lesions (paresis, paralysis, tics) call for medical or surgical treatment, as the case may be.

(7) Pseudarthroses must be treated by means of osteosynthesis, with or without osseous grafts. Metallic osteosynthesis has not yielded good results.

(8) For the sequelae of soft parts, such as vicious cicatrices, cosmetic surgery must be resorted to.

(9) Faulty consolidations must be operated upon by surgeons skilled in maxillo-facial surgery.

(10) The effect of maxillo-dental injuries on the general condition (anemia, cachexia, dyspeptic disturbances) and on the psychic state, indicates the importance of treatment of this type of sequelae.

(11) From the medico-military viewpoint, casualties suffering from the sequelae of maxillo-facial wounds are entitled to disability rights of 20–40 per cent, with a pension of 60–80 per cent.

Galata (Italy).

Professor Dr. Guglielmo Galata, Lieutenant Colonel, Royal Navy (Italy), presented a communication on *Instruments for Operations on the Skeleton.*

The instruments devised by the author for operations on the bony framework aim at overcoming the difficulties confronting the surgeon, through the hardness of the material to be dealt with. The ideal objective would be to accomplish in the hard tissues, approximately the same effect as is exerted by knives and other cutting implements in the soft tissues. This problem is not easy, however, since, in addition to being a question of mechanical technique, it is also one of surgical technique and, therefore, more subtle and complicated. It is not only a question of finding a perfect equilibrium between strength and resistance, perforating or cutting through and along compact bones, even of considerable thickness, but of being enabled to do so with great rapidity, by means of instruments of surgical configuration, not cumbersome tools, with a guaranty of uninterrupted function during the operation and with absolute individual safety for the patient, as well as the surgeon. Such an objective may be successfully achieved. The requisite conditions are that the complementary aspects of the problem—rapidity and continuity of function, simplicity and light weight of the instruments—be taken into consideration, together with the principal problem, all assisting in the conception and construction of every part of these instruments. The author gave a practical demonstration of his surgical instruments (which he presented to the Congress), including an automatic trephine for use in the performance of craniotomy, which can be done in four successive steps, in five minutes.

CONCLUSIONS OF THE CONGRESS

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The conclusions which follow were unanimously accepted by the entire Congress. After the reading and discussion of the official reports and communications, subcommittees drew up the conclusions, submitted them to the Permanent Committee which made certain changes, presented the revised version to the Congress as a whole, and made any necessary additions or modifications in order to secure full agreement by all.

I. THE RECRUITING, TRAINING, AND ADVANCED TRAINING OF MILITARY MEDICAL OFFICERS AND PHARMACISTS

(1) The question of recruiting has only two solutions:

(*a*) Early recruiting among medical and pharmaceutic students at the beginning of their studies;

(*b*) Late recruiting among graduate physicians and pharmacists.

The first system would seem to be of a kind to widen the selection and to recruit capable men before they decide on a career in civil life. The efficiency of the medical service depends essentially upon the quality of its officers. It is, accordingly, necessary to express the wish that governments may offer such advantages and inducements as to attract the best candidates.

Early recruiting involves acceptance by competitive examination; such examination might be criticized as dealing with knowledge too recently acquired. This can be corrected by introducing tests of general culture into the program.

(2) The training of the military medical officer and pharmacist must embrace the medical or pharmaceutic science and military instruction. To be undisputed, the standard of medical knowledge must be capable of comparison. Consequently, it is essential that it have a common source and be carried out under similar conditions. The training of military medical officers and pharmacists must, therefore, be entrusted to the civilian faculties. The military train-

ing should be carried out in special schools of the medical service, and must be of an essentially practical nature.

(3) It is desirable that throughout their career, military medical officers and pharmacists should attend courses of instruction in both professional and military subjects. Exclusive specialization along purely professional or military lines does not provide for the best interests of the military medical service, whose leading authorities must always be in a position to manage all departments of the service.

(4) The training of reserve officers of the medical service should be carried out during the entire period of their service in the special training schools. Their instruction should be further improved by graded training of an essentially practical character and adapted to the duties which these officers will be expected to carry out in time of war.

(5) The Congress expresses the wish that the various nations will favorably regard the proposal of an exchange of officers of the medical services among the different countries.

II. THE PSYCHONEUROSES OF WAR: THE IMMEDIATE AND REMOTE EFFECTS OF WAR ON THE NERVOUS SYSTEM OF COMBATANTS AND NONCOMBATANTS

(1) War, especially when of long duration, plays an undoubted part in the genesis and incidence of mental disturbances observed in the course of hostilities. Psychopathic heredity, degenerative conditions, and morbid constitutional tendencies are not, however, the only causes of mental disorders. The occasional factors are of undeniable importance and, in time of war, these factors are numerous and their rôle considerable: Wounds, shock, physical fatigue (physiological depression), infections, various intoxications (alcoholism), moral shock, emotions. The rôle played by emotional shock is especially important in the genesis of the psychoneuroses, hence the frequency, during the war, of post-emotional syndromes and hysterical states.

(2) However, war has not created psychoses of a new kind, with a hitherto unknown symptomatology and evolution. No new pathological entity has been observed; only the relative frequency of certain psychoses has been modified (frequency of confusional states on the bases of emotivity), described during the war as "shell shock" or "post-concussional syndrome". These denominations have, at

times, been erroneously applied. It is advisable to abandon these terms or to restrict their employment to closely controlled cases.

(3) The symptomatology of every war psychosis was found to be entirely comparable to that observed in the same patients in peace time, but this symptomatology was colored by the events of the war, of which it was a faithful reflection.

(4) The anti-social reactions, produced by the psychoneuroses of war, were likewise of the same character as those occurring in peace time, but assumed a special complexion due to the circumstances of war and had more serious consequences than during peace, both for the patients and their surroundings, as well as for discipline in the armies.

(5) The responsibility for psychoneurotics produced by the war has been accepted by the State, as regards the granting of disability pensions.

In the case of delinquencies among persons suffering from psychoneurotic disturbances, the medical expert called on for his opinion as to the penal responsibility of the patient should be a psychiatrist. He can formulate positive conclusions only after a profound study of each individual case.

(6) Provision should be made in peace time for the organization of the neuropsychiatric service in the field. This service should comprise:

A. A neuropsychiatric center per army, installed near the principal evacuation hospital and essentially intended for the sorting of men suffering from neurological or psychopathic disturbances, with evacuation to the rear of serious cases; and for the treatment of all patients presenting disturbances likely to be cured within a short time.

B. Special provision for evacuation of personnel and material, to be placed at the disposal of the regular evacuation trains in case of need.

C. A regional neuropsychiatric center, in every region of the interior, installed in the principal hospital of the chief city, liberally supplied with specialized personnel and charged with:

(*a*) a second sorting of the patients;

(*b*) their classification in three groups: Major psychopaths, to be interned in asylums; patients suffering from acute transitory and benign disturbances (these to be treated in the regional center itself); patients presenting curable psychoneuroses, but requiring more prolonged

treatment. For the latter group, it is advisable to provide for the organization of secondary regional centers, destined especially for the treatment of curable psychoneuroses (minor mental cases).

(7) In time of peace it is advisable to provide for the selection of cases of mental disorder by a medical board composed of competent psychiatrists, and for the special employment of these men during war, in such occupations where they may render useful service. This solution is indispensable for the proper utilization of these "brain cripples" and for the application of the elementary rules of mental prophylaxis. This task will prove more difficult in those countries which have no compulsory military service.

III. METHODS OF HEMOSTASIS ON THE BATTLEFIELD: STANDARDIZATION OF FIRST-AID MATERIAL AND THE MODE OF APPLICATION

(1) Emergency hemostasis on the battlefield raises the question of the tourniquet, a nearly always useless and always dangerous measure, especially in nonprofessional hands. However, to guard against the use of a method still more injurious to the tissues, it is perhaps inadvisable to prohibit its employment definitely.

(2) The equipment to be allowed to the nonmedical personnel should include bandages which do not contain rubber, hemostatic tampons, and also, in reserve, a hemostatic bandage in case the compresses are not sufficient.

(3) The instruction of stretcher bearers, soldiers, and officers, should include the dangers of the tourniquet and the sole indication for its use, namely, spurting hemorrhage.

(4) To a certain extent, hemostasis at the aid post may be left to the initiative of the medical officer in charge (provisional closure by cutaneous sutures or clamps, tamponing, with adjustment, if necessary, of a provisional tourniquet, over the dressings, to be tightened only in case of necessity).

(5) It is advisable to continue the research indicated in the Italian reports, with the view of eliminating the dangers of ischemia from the application of the tourniquet.

(6) The essential question is apparently that of instruction of the subordinate personnel. The Congress expresses the hope that this instruction be standardized in all armies.

(7) It seems desirable that an inquiry be instituted by the Committee on Standardization of Medical Equipment, as to the best type of hemostatic bandage.

IV. THE PREPARATION AND STORAGE OF MEDICINAL AMPOULES IN USE IN THE NAVAL AND MILITARY MEDICAL SERVICES

(1) The ampoules must first be cleaned and sterilized. Method of sterilization: 160° Centigrade for two hours.

(2) It is recommended to employ freshly distilled water or aseptically preserved distilled water.

(3) For oily injection fluids, the utilized oil must be neutral and sterile.

(4) The better the aseptic precautions are observed in the course of preparation, the easier and more reliable will be the sterilization.

(5) The perfect method is sterilization in the autoclave at different temperatures from 110° to 120° Centigrade for fifteen to twenty minutes, according to the case. Other methods are by current steam at about 100° Centigrade and tyndallization at 60°–70° Centigrade for one hour on three consecutive days.

With respect to the aseptic preparation of injection fluids, it is of importance strictly to observe the precautions indicated above.

(6) The utilization of bougie filters always necessitates a bacteriological control of the finished product.

(7) The proper preservation of medicinal ampoules necessitates the employment of neutral glass, strictly controlled.

(8) As a general rule, it is preferable to renew stocks as frequently as possible.

V. THE SEQUELAE OF WAR WOUNDS OF THE TEETH AND INFERIOR MAXILLA: THEIR TREATMENT

(1) The prevention of the sequelae of wounds of the lower jaw and the teeth depends, to a large extent, on the initial treatment.

(2) The treatment of these wounds necessitates, from the start, the collaboration of a dental specialist and the operating surgeon, which is realized in some countries through the Maxillo-facial Staff.

(3) The infection of bony fragments is especially to be dreaded. It is maintained by the presence of foreign bodies or of tissue acting

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as such—bone, sequestrum, or tooth. The treatment consists in the removal of all causes of infection.

(4) The pseudarthroses, where there is definite loss of substance which can not be cured by appliances, come under the domain of surgery (bone grafts). Metallic osteosynthesis is contra-indicated.

(5) Viscious callus is amenable to osteotomy, with or without bone grafting, in addition to immobilization in good position.

(6) Injurious effects on the teeth—necrosis from neurovascular rupture, destruction of the alveolus, loss of dental apposition, loss of teeth—should be treated as soon as possible.

(7) Temporomaxillary ankyloses should be treated by arthrotomy and mobilization apparatus.

(8) Viscious cicatrices and losses of substance of the soft parts belong to the domain of plastic surgery.

(9) Secondary neuritis is amenable to the customary treatment for neuritis.

(10) In cases of facial injuries, one must never lose sight of the effect of these wounds on both the general and psychological state of the individual.

(11) Experience in the World War has shown the imperative necessity for the education in peace time, of a sufficient number of specialists, to treat maxillo-facial injuries, in all echelons.

SUPPLEMENTARY NOTES

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ADDRESS AT THE FINAL SESSION OF THE CONGRESS BY HIS EXCELLENCY DR. F. CASTILLO NAJERA, MINISTER PLENIPOTENTIARY OF MEXICO TO THE NETHERLANDS

The Congress now about to be closed has been characterized by a special enthusiasm, by an animated and cordial participation by all in a spirit of fraternity. It is of prime importance that such amicable relations have been created or increased among the members of the military forces of several nations. This union of medical officers might well become the germ of a permanent universal association, having the unique rôle of creating a tie between peoples and of achieving definite peace—the dream, the ideal, the inspiration of all with good will to men.

The speaker thanked General Diehl, General Kalff, and the entire personnel for all their efforts in making the Congress a success. He also expressed appreciation to the Permanent Committee, whose difficult tasks are visibly demonstrated in the intelligent activity of its Secretary. He made grateful acknowledgment to the authorities of the Kingdom and the local officials who vied with one another in graciousness. "A most sympathetic remembrance will always be held for the perfect gentleman and distinguished statesman of exceptional qualities: His Excellency the Minister of National Defence." Homages of profound gratitude and respect were extended to His Royal Highness the Prince of the Netherlands, for the support graciously lent by him to the Congress and for his participation in it. Finally, the most sincere and respectful good wishes were expressed for "the exceptional woman, the living incarnation of the highest virtues of contemporaneous womanhood, Her Majesty the Queen, who governs her admirable people with so much dignity and tact, a model of civilization, moral standards, and culture."

INTERNATIONAL OFFICE OF MEDICO-MILITARY DOCUMENTATION—ITS FORMATION

In August, 1930, an International Assembly of the Heads of the Medical Service of the Army, Navy, and Air Force of the Various

Countries was held in Liége. Thirty-six nations were represented, including the United States of America, by its member of the Permanent Committee of the International Congress of Military Medicine and Pharmacy. Many points were discussed of international interest. The recommendations, as drawn up, were submitted to the Minister of War and the Minister of State of Belgium, who forwarded them to the state departments of the different countries.

The matter brought before the Assembly was the creation of an International Office of Medico-military Documentation, near the office of the Permanent Committee of the International Congress of Military Medicine and Pharmacy. The purpose of this office is to centralize complete medico-military information of all kinds, in peace and in war. The collection will be permanently at the disposal of the participating nations, who are requested to furnish copies of all official documents, etc., they possess on the subject (except those which are privileged), and to share in the expenses of the office, based on the classification made by the League of Nations.

The Permanent Committee of the International Congress of Military Medicine and Pharmacy is the Executive Committee of the International Office of Medico-military Documentation, and supervises all details.

This office will also act as an information bureau in regard to the proposal put before the Assembly, for an international exchange of officers of the medical services among the different countries which accept the plan.

At the meeting of the Permanent Committee of the International Congress of Military Medicine and Pharmacy in June, 1931, at The Hague, its Secretary reported those countries which have thus far agreed to cooperate fully with the International Office of Medico-military Documentation—France, Denmark, Poland, China, Lithuania, Netherlands, Belgium, Yugoslavia, Switzerland, Spain, and Rumania; Norway will do so with a few conditions of reservation.

The office has been started and is actively progressing.

INTERNATIONAL OFFICE OF MEDICO-MILITARY DOCUMENTATION—FIRST MEETING, JUNE 23–25, 1931

Several of the official delegates from the United States—Captain Pryor, Colonel Fenton, Colonel Hume, and Commander Bainbridge—proceeded to Brussels from The Hague, to attend the first meeting of the International Office of Medico-military Documentation. The

conferences were held at the Military Hospital. The following papers were read:

Sanitary Tactics, Inspector General Spire (France).
Hygiene of European Soldiers in the Colonies, Colonel Gravellat (France).
Organization and Tactical Use of Alpine Sanitary Troops, Colonel Thomann (Switzerland).
The Problem of Evacuations, Colonel Schickele (France).
New Ideas Regarding Tuberculosis Virus and Its Use for Army Prophylaxis, Commandant Georgevitch (Yugoslavia).
The New Geneva Convention, Lieutenant General Demolder (France).
Prophylaxis of Intestinal Infections in the Army, Lieutenant Colonel Babecki (Poland).
Army Surgery, Major General Derache (Belgium).
Training the Flight Surgeon, Major Sillevaerts (Belgium).
Modern Characteristics of Sanitary Material for Use in Action, Colonel van Baumberghen (Spain).
Eye Wounds at the Front, Colonel Fenton (United States of America).
International Law as Related to Military Medical Services, Colonel Voncken (Belgium).

Colonel Fenton's paper, which he delivered in French, was very well received by the assembly.

It is evident that a great deal of enthusiasm has been aroused over the International Office of Medico-military Documentation. Plans are being made for periodic meetings.

HONORS TO GENERAL DIEHL

Two of the American delegates, Colonel Hume and Commander Bainbridge, arrived at The Hague a few days prior to the opening of the Congress in order to attend to certain preliminary work. At the direction of the chief of the delegation, Captain Pryor, who, with the other American delegates had not yet reached The Hague, and in accordance with the unanimous vote of the Association at its Denver meeting, they bestowed upon the President of the Congress, the Director General of the Netherland Army Medical Service, Major General J. C. Diehl, the Cross of and Honorary Membership in the Association of Military Surgeons of the United States. The ceremony was held on American soil—at the American Legation—in the presence of the Minister, Honorable L. S. Swenson, the Legation Staff, and the Staff of General Diehl.

In their presentation speeches Colonel Hume and Commander Bainbridge told of the formation of the Association, explained the Congressional authorization of the special Cross (the only other deco-

ration an American officer is authorized to wear on his uniform apart from his war decorations), and enlarged upon the distinguished services of General Diehl during the war, especially in the internment camps of Holland, and his outstanding position as a leader in military medicine and sanitation.

At the inaugural session, and throughout the Congress meetings, General Diehl wore the cross of the Association.

Both Belgium and Yugoslavia decorated General Diehl with high orders.

APPRECIATION TO COLONEL VONCKEN

It was decided that, at the Sixth Congress, which marked the tenth year since its inception, a token of appreciation be tendered to Colonel Voncken, the Secretary of the Permanent Committee, through whose untiring efforts, marked ability, and keen interest in every phase of the work, much of the growth and present great success of the Congress is due. A beautifully engrossed scroll, expressing the appreciation of the entire Congress, was presented to him with the gratitude and affection of officers, delegates, and members.

INTERNATIONAL HISTORIC EXHIBITION OF THE MEDICAL SERVICES

A very interesting and instructive exhibition of military medical, surgical, and sanitary material was held in several of the rooms of the Hall of the Knights. Many countries sent valuable contributions. The exhibit of the Army, Navy, and Public Health Service of the United States was prominently displayed. The historic side of military medicine was particularly stressed.

RESOLUTION UNANIMOUSLY PASSED BY THE DELEGATES OF THE UNITED STATES OF AMERICA

On the last day of the Congress, the following resolution was drawn up and signed by the entire delegation from the United States of America present at The Hague:

WHEREAS, The International Congress of Military Medicine and Pharmacy, composed of military and naval medical representatives of the nations of the world, have been held with marked success in Brussels in 1921, Rome in 1923, Paris in 1925, Warsaw in 1927, London in 1929, and The Hague in 1931, and

WHEREAS, The great humanitarian work of these Congresses is unquestioned and they bring together medical officers of all nations to discuss problems of importance to all in the interest of performing the duties expected of medical officers in peace and in war, chief among which are the alleviation of suffering and the prevention of those epidemics which in the past have accompanied wars, and

WHEREAS, These Congresses have united in friendly conference, representatives even of nations that have opposed each other on the field of battle, and

WHEREAS, The International Congress of Military Medicine and Pharmacy has accepted the invitation of the Spanish Republic to hold the meeting of 1933 in Madrid, and the decision as to the meeting-place of the Congress of 1935 must be fixed by the Permanent Committee of the Congress not later than December 31, 1932, and

WHEREAS, The ideals of the International Congress of Military Medicine and Pharmacy are those dear to the American people and its military, naval, and public health medical officers, not only in their war duty but no less in the peace-time warfare against disease and suffering; therefore be it

Resolved, That the Association of Military Surgeons of the United States in annual meeting assembled endorse the work of the International Congresses of Military Medicine and Pharmacy, and in order to further these ideals and contribute America's share in the work, that the United States Congress be asked to extend an invitation to the International Congress of Military Medicine and Pharmacy to hold their biennial meeting of 1935 in the United States, and be it further

Resolved, That the Association of Military Surgeons of the United States appoint a committee to carry out this resolution and bring the same, through proper channels, to the attention of Congress; and that if favorable action be taken by Congress, that this committee take charge of the organization of the Eighth International Congress of Military Medicine and Pharmacy to be held in the United States in 1935, with power to enlarge its membership and establish subcommittees.

Capt. JAMES C. PRYOR, M.C., U.S. Navy.
Col. C. R. REYNOLDS, M.C., U.S. Army.
Asst. Surg. Gen. R. C. WILLIAMS, U.S.P.H.S.
Col. R. A. FENTON, Med. Res., U.S. Army.
Comdr. WILLIAM SEAMAN BAINBRIDGE, M.C.-F., U.S.N.R.
Col. F. H. VINUP, M.C., Md. N.G.
Maj. EDGAR ERSKINE HUME, M.C., U.S. Army.
Col. J. H. MCCULLOUGH, M.C., N.J.N.G.
Lieut. Col. FRANCIS FRONCZAK, Med. Res., U.S. Army.

This, expressed in official form, is the hope of all our delegates that our Government will see its way clear to forward an invitation to the Secretary of the Permanent Committee for the 1935 Congress to be held in the United States. It will be necessary for such an invitation to be received at Liége before the first of January, 1933, if it is to be accepted.

RECOGNITION TO GENERAL DEMOLDER FROM THE ASSOCIATION OF MILITARY SURGEONS OF THE UNITED STATES

At the American Embassy in Brussels, with the Chargé d'Affaires acting in the absence of Ambassador Gibson, Lieutenant General Paul Demolder, Director General of the Belgian Army Medical Service, had bestowed upon him the Cross of and Honorary Membership in the Association of Military Surgeons of the United States, by Captain J. C. Pryor, Medical Corps, United States Navy. This was in accordance with the direction of the Executive Council of the Association. Speeches were also made by Doctor Hume and Commander Bainbridge, who acted as aides. In addition, the Embassy Staff and the Staff of General Demolder were present. General Demolder was deeply touched by this expression of esteem, which came on the tenth anniversary of the inauguration of the International Congress of Military Medicine and Pharmacy, by Belgium and, hence, was very fittingly tendered to the Chief of the Sanitary Service of his country.

CONFERENCE OF THE MEDICAL UTILITY OF AVIATION IN THE COLONIES, JULY 24–30, 1931, PARIS

At these very interesting meetings, attended by some of the United States delegates to the International Congress of Military Medicine and Pharmacy at The Hague, the development of aerial ambulances, as well as the use of aeroplanes for conveying medical aid and supplies, was outlined. Practical demonstration flights of medically equipped aeroplanes were organized. This well-attended Conference clearly pointed out the actual use made of aerial ambulances in the colonies, and further plans for their utilization.

MISCELLANEOUS—THE HAGUE CONGRESS

A banquet, presided over by His Royal Highness Prince Hendrik and His Excellency the Minister of National Defense, was tendered by the Netherland Government to the official delegates to the Congress, at the Kurhaus in Scheveningen on the sea. The entire Diplomatic Corps, many members of the Ministry, and Government officials also attended.

Afternoon and evening receptions were held by the Government of the Netherlands, the Mayor of The Hague, the Netherland Red

Cross Society, and the Minister of the United States to the Netherlands.

These social functions are admitted by all in attendance at the Congress to play an important rôle in developing a spirit of confraternity and in fostering friendships among the representatives of many nations, which are of far-reaching value.

A Ladies' Committee attended to the entertainment of the ladies who accompanied the delegates. Beautiful trips were taken and an interesting program carried out.

The official delegates to the Congress proceeded to Delft and, in uniform and with full ceremony, placed a wreath on the Tomb of "William the Silent", father of the house of the Queen of the Netherlands, whose name to his people is a symbol of independence. Vice Admiral Sir A. J. Gaskell spoke for the delegates, and the Minister of National Defense of the Netherlands replied most appreciatively.

Specially arranged trips to Amsterdam, Rotterdam, Utrecht, Amersfoort, Doorn, Arnhem, Nymegen, Oss, etc., were taken by many of the delegates after the close of the Congress. The cities are exceedingly beautiful with their tree-shaded avenues and the canals. At Oss the delegates were particularly interested in the laboratory "Organon", where research work of the highest order in organotherapy is being carried on, and preparations manufactured.

Everywhere, and at every turn, true Dutch hospitality was showered upon all who attended the Congress. General Diehl, Jonkheer van Boelens, Doctor de Lint, General Kalff, and their assistants on the Committees, managed an Herculean task most effectively. There were many volunteer helpers, without whose aid the details of the Congress could hardly have been carried out. Minister Swenson and Commander Corwin of the Legation of the United States were exceedingly cordial and lent valuable assistance. Nothing that could have been done was left undone by the authorities in the Netherlands. Thus, the tenth anniversary meeting of the Congress was a highly successful one and marked a step forward in medico-military internationalization.

A group that strives together for the common humanitarian goal of winning the fight against disease and suffering, and of saving life and limb, can not fail to cement ties of mutual respect and esteem. As the representative individuals of different nations reach this stage of personal and intellectual regard for one another, so, surely, must their governments be influenced; and these International Congresses of Military Medicine and Pharmacy help toward bringing friendly relations among the peoples of the earth, on the basis of real understanding.

ALPHABETICAL LIST OF CONTRIBUTORS

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PREVIOUS UNITED STATES REPORTS

ON THE

INTERNATIONAL CONGRESSES OF MILITARY MEDICINE AND PHARMACY

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A limited number of the above reports, except that of the First Congress, are available for general distribution. Requests for them should be addressed to—

The Military Surgeon,
Army Medical Museum,
Washington, D. C.
(Postage 10 cents should be enclosed.)

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